American Journal of

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October 11–15

OCTOBER, 1954

volume 44

number 10

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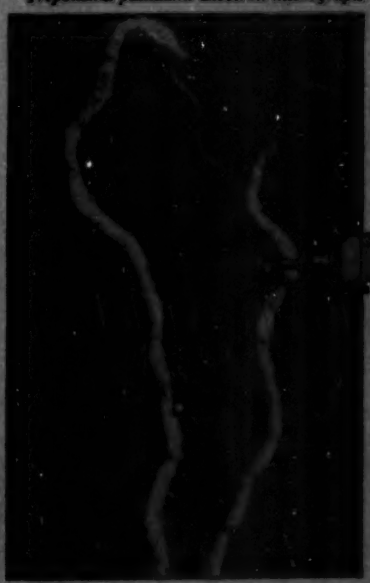

1. Smith, C. A., and others: Am. J. Syph., Gonor. & Ven. Dis. 38:136 (March) 1954
2. Moore, J. E.: Ann. Int. Med. 39:644 (Sept.) 1953

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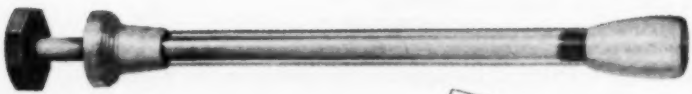

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Official Monthly Publication of the American Public Health Association, Inc.

Volume 44 | October, 1954 | Number 10

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CONTENTS

PAGE

Public Health and Religious Freedom 1293
James A. Tobey, Dr.P.H., LL.D.

Studies of the Viability of Histoplasma capsulatum in Tap Water 1299
Cassandra Ritter

Effect of Standard Water Purification Processes on the Removal of Histoplasma capsulatum from Water 1305
Dwight F. Metzler, C.E.; Cassandra Ritter; and Russell L. Culp

Significance of "Cysts" Following Injections of Antigens 1314
V. K. Volk, M.D., Dr.P.H.; Franklin H. Top, M.D., M.P.H.; and William E. Bunney, Ph.D.

Bacteriophage Active Against Virulent Mycobacterium tuberculosis—I. Isolation and Activity 1326
Seymour Froman, Ph.D.; Drake W. Will; and Emil Bogen, M.D.

Continued on page vi

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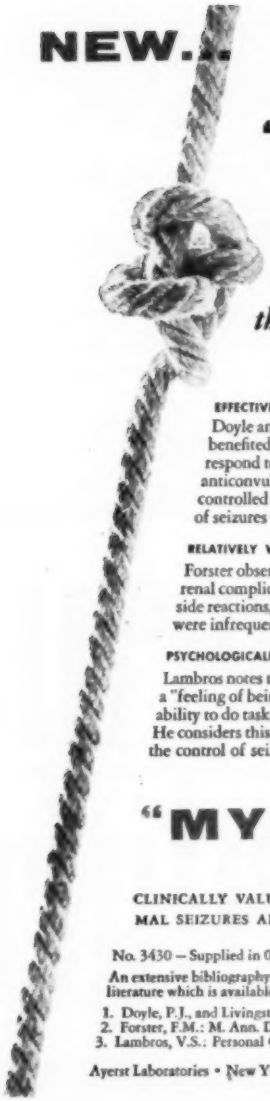

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1. Doyle, P.J., and Livingston, S.: J. Pediat. *43*:413 (Oct.) 1953.
2. Forster, F.M.: M. Ann. District of Columbia *23*:137 (Mar.) 1954.
3. Lambros, V.S.: Personal Communication.

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Contents—Continued PAGE

A Soluble Gelatin Foam Sampler for Air-Borne Microorganisms at Surface Levels 1334
ROLAND B. MITCHELL, PH.D.; MAJOR JOHN D. FULTON, USAF (MSC); AND LT. COLONEL HAROLD V. ELLINGSON, USAF (MC).

Comprehensive Medicine in Relation to Public Health 1340
WILLIAM W. SCHOTTSTAEDT, M.D.

A Proposed Plan for Community-Wide Mental Health 1345
LEONARD T. MAHOLICK, M.D., AND MITCHELL H. WETHERHORN

Public Health's Interest in Home Accident Prevention 1349
EMIL A. TIBONI, M.P.H.

Teaching Public Health to Dental Students 1352
D. M. HADJIMARKOS, D.D.S., M.P.H.

A Compilation of Epidemiologic Studies in Dental Caries 1357
MAURY MASSLER, D.D.S.; J. J. PINDBORG, D.D.S., DR. ODONT.; AND CLIVE MOHAMMED, L.D.S.

EDITORIALS:
The Fifth International Congress on Mental Health 1363
Allen Weir Freeman 1364
A Step Toward Professional Preparation 1365

Credit Lines 1366

Books and Reports 1369

Books Received 1376

A Selected Public Health Bibliography 1377

Association News 1381
Fourth Conference on Field Training of Public Health Dentists. Eighty-third Annual Meeting in Kansas City, Mo., 1955.

Employment Service 1383

News from the Field 1387

Conferences and Dates 1392

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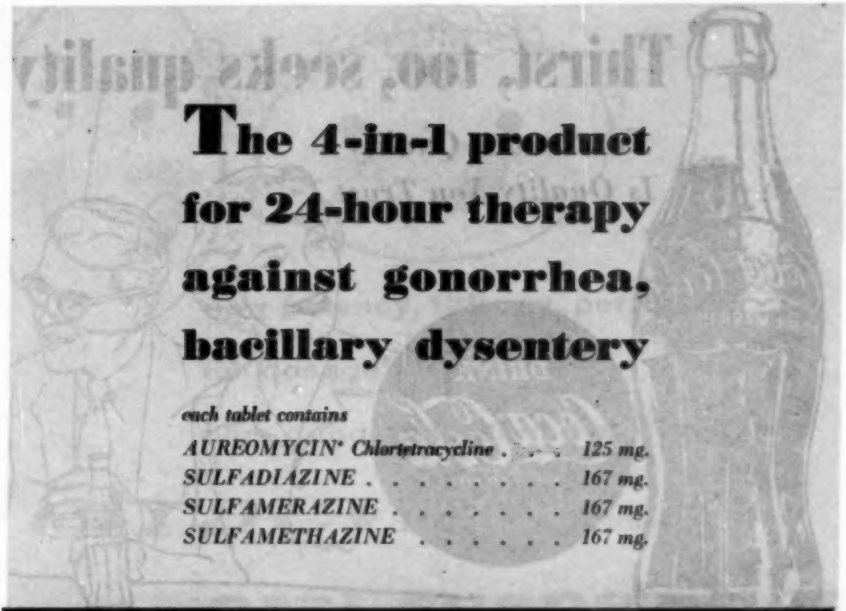

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INDEX TO ADVERTISERS

	Page
American Public Health Association:	
Book Service	XXIII, XXVII
Membership Application Blank	XXIII
Sustaining Members	XXII
American Meat	XXXI
American Seal-Kap Corporation	XXV
American Sterilizer	XIV
Ayerst Laboratories	V
Coca-Cola	VIII
Corning Glass Works	XVI
Crown Cork & Seal	XIX
Difco Laboratories	Back Cover
Directory of Exhibits	XXVIII, XXIX
Directory of Health Service	XXIV
Black & Veatch	
Emerson Venable, P.E.	
Professional Examination Service, A.P.H.A.	
Diversey Corporation	XXV
Dixie Cups	XXI
Florida Citrus Corporation	XI
Holland-Rantos Company, Inc.	XXI
Lederle Laboratories	VII, XIII
Lehn & Fink Products Corporation	XXX
National Dairy Council	XV
Odara Products, Inc.	XVII
Ortho Pharmaceutical Corporation	III
Oval Wood Dish Corporation	XXIV
Roerig, J. B., Co., Inc.	IX
Sterwin Chemicals, Inc.	XII
Wallace & Tiernan	X, XX
White Laboratories	XVIII
Wyeth, Inc.	II

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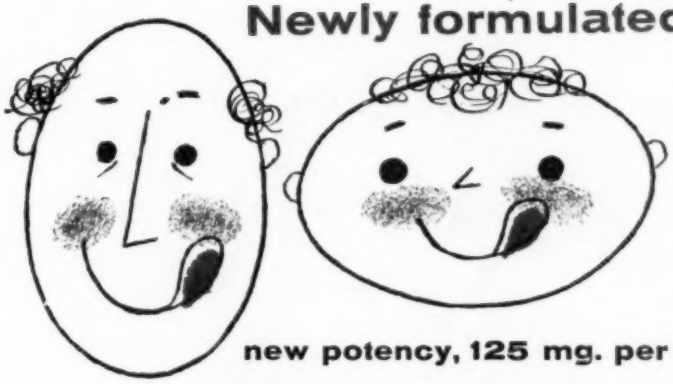

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(1) Hopkins, J. G.: AMA Arch. Dermat. & Syph., 67:479-483 (1953).
(2) Sullivan, M., and Bereston, E. S.: J. Invest. Dermat., 19:175-178 (1952).

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**Chick, H.: Nutrition 7:59, 1953; Cotereau, H. et al.: Nature 161:557, 1948. Jolliffe, N. et al.: Clinical Nutrition; Hoeber, New York, 1950; pp. 586-601.*

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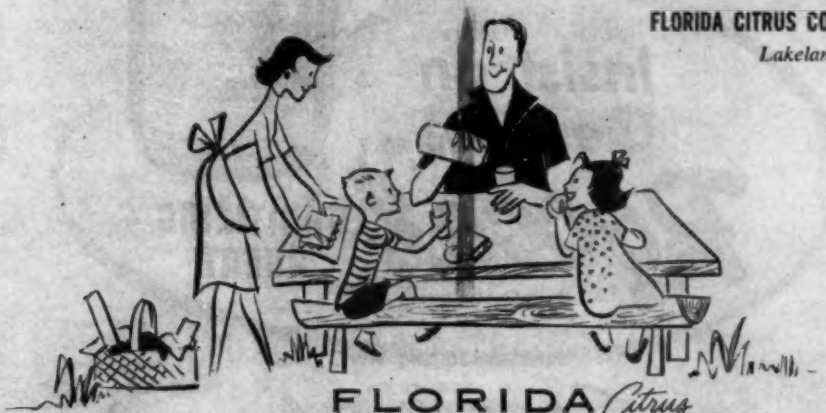

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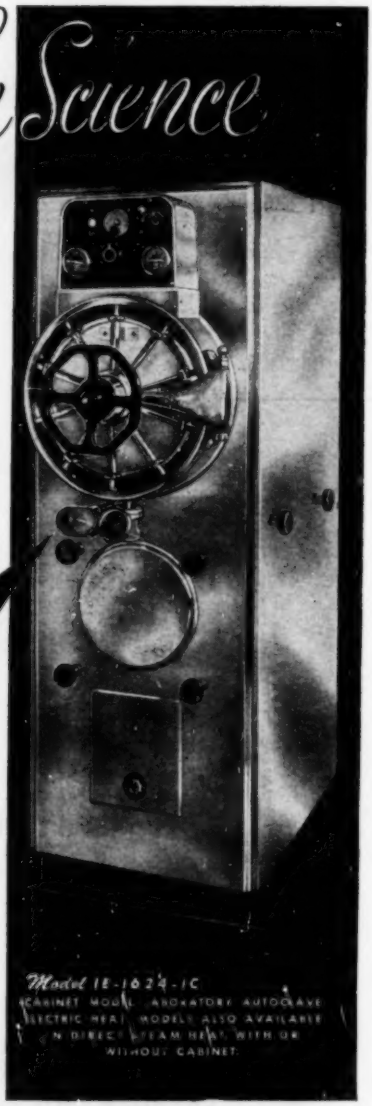

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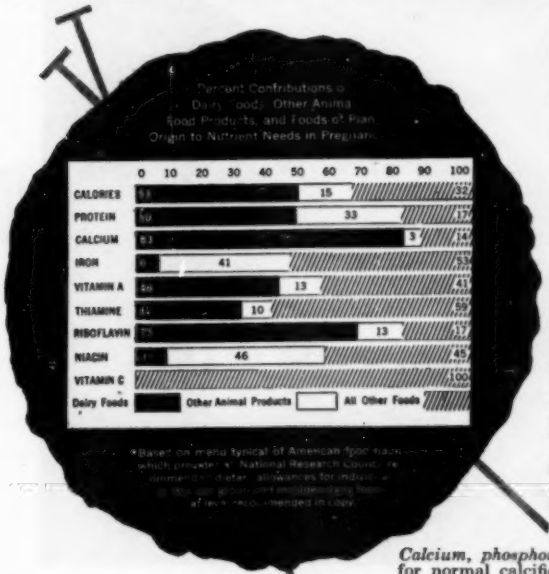
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1. Toverud, K. V., Stearns, G., and Macy, I. G.: Maternal Nutrition and Child Health. Bulletin No. 123, National Research Council, Washington, D. C. (Nov.) 1950.
2. Keane, K. W., Cohn, E. M., and Johnson, B. C.: Reproductive failure of rats on glyceryl trilaurate-containing diets and its prevention by certain natural fats. J. Nutr. 45:275 (Oct.) 1951.

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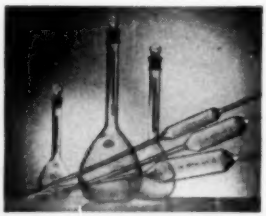

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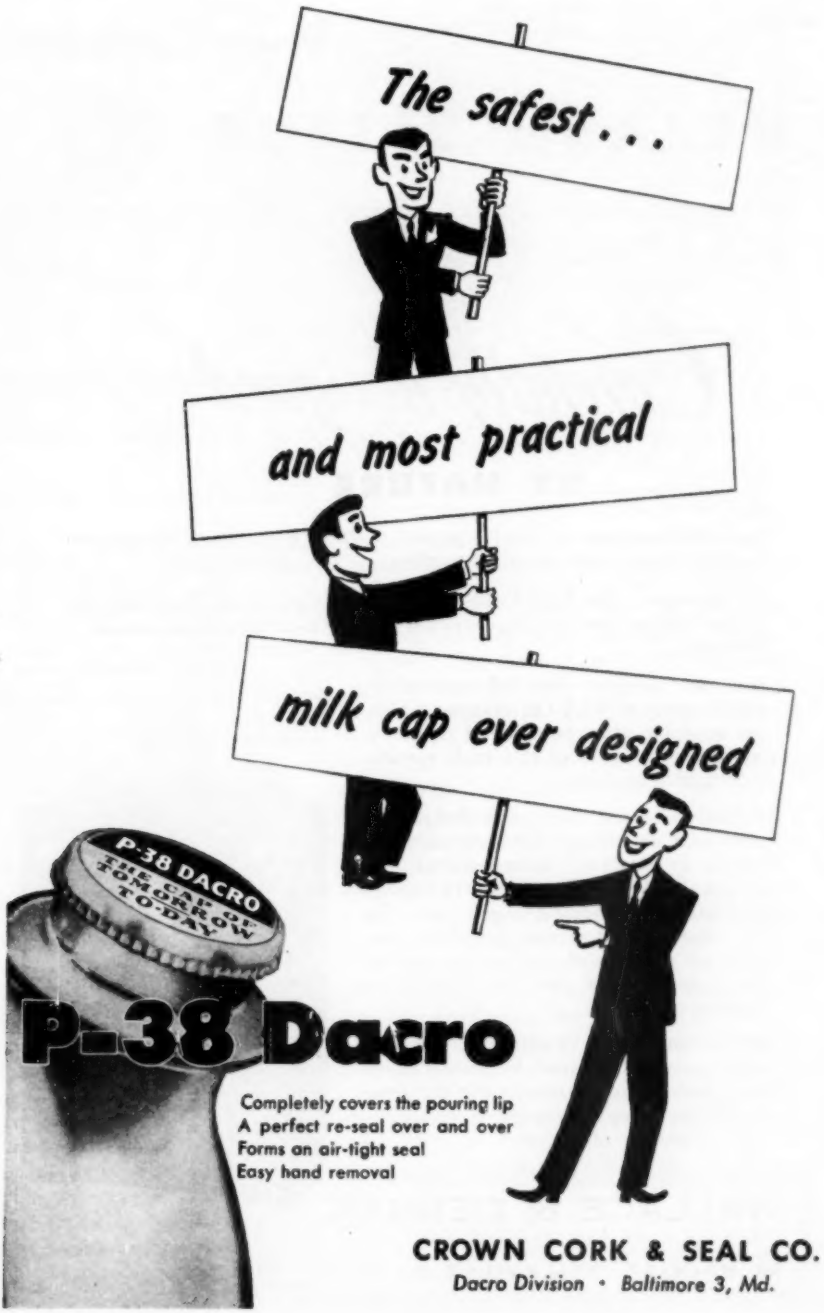

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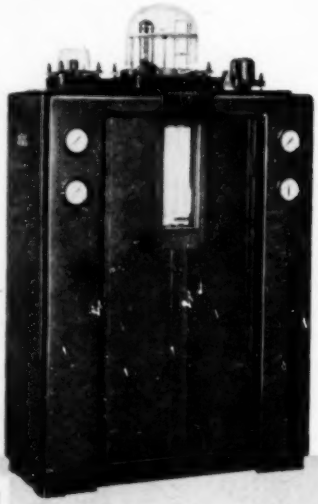

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American Journal of

PUBLIC HEALTH

Official Monthly Publication of the American Public Health Association, Inc.

Volume 44 | October, 1954 | Number 10

Public Health and Religious Freedom

JAMES A. TOBEY, Dr.P.H., LL.D., F.A.P.H.A.

It is reassuring to be reminded that the country's courts are to be found so often on the side of public health, and that what would seem the objector's sharpest weapon, religious freedom, cannot be counted upon to sway judicial emotion and so to influence decision.

Freedom of religion has long been recognized as a fundamental principle of the American system of government. Religious liberty always has been one of the inalienable rights of citizens of the United States, but this vested right is not unlimited, and the actual extent of its operation has given rise to many misconceptions. Whenever the exercise, or alleged exercise, of religious freedom has come in conflict with public health laws, medical practice acts, and laws requiring adequate medical care for minor children, the courts of last resort in this country invariably have ruled that it is public health which must prevail. Freedom of belief may be absolute, but freedom of action is not.[1]

The concept of religious freedom arose in the earliest days of the American colonies and has been written into our federal and state constitutions. Article VI of the federal Constitution, effective in 1789, states that, "No religious test shall ever be required as a qualification to any office or public trust under the United States." The First Amendment to the Constitution, adopted in 1791, declares that, "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof."

These provisions are limitations only on the federal government. Nowhere in the federal Constitution is there any language expressly requiring the states to guarantee religious liberty. In recent years judicial opinion has held, however, that religious freedom and all the other privileges of citizens which are so cogently set forth in the first 10 amendments, our so-called Bill of Rights, are imposed upon the states by the Fourteenth Amendment to the federal Constitution.

This amendment, adopted in 1868, says that, "No State shall make or en-

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force any law which shall abridge the privileges and immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws." These principles often have been invoked by individuals who have considered themselves oppressed by public health laws enacted and enforced for the general welfare.

The adherents of certain religious sects teach and believe that disease is unreal, that it arises from error and evil, and that when maladies occur, as they do, they can be healed by divine intercession operating through faith and prayer. The true scientist may disagree with such doctrines, but their followers have a legal right to their beliefs. They do not, however, have any right to endanger others, or the entire community, by the practice of these beliefs.

Members of religious sects who espouse faith healing in one form or another do not accept, and often actively oppose, established and reasonable public health procedures, such as vaccination and immunization, physical examinations, use of x-rays and laboratory methods, blood tests, quarantine, pasteurization, chlorination and fluoridation of water supplies, and the various medical, surgical, hospital, nursing, dental, nutritional, and sanitary engineering procedures which are essential in certain situations. This opposition has given rise to considerable litigation in this country, the results of which have served only to strengthen public health administration.

In 1878 the Supreme Court of the United States laid down the rule that freedom of belief is absolute, but that freedom of action is not, and that all acts or conduct of our citizens must conform to all reasonable regulations adopted by governmental agencies acting within the scope of their authority.[2] This case and a number of others sustained the powers of the federal and state governments to prohibit the practice of polygamy and upheld the conviction of a prominent member of the Mormon Church for bigamy. In 1890 the Mormons officially submitted to the laws of the land in this matter and renounced plural marriage. This decision of the Supreme Court, as well as many others, have settled once and for all the proposition that in matters of law, government, and civil conduct no church is or can be above the state.

Nearly half a century ago, in 1905, the Supreme Court of the United States upheld the principle of compulsory vaccination in the famous case of Jacobson vs. Massachusetts,[3] and reaffirmed this decision in 1922 in the Texas case of Zucht vs. King.[4] Despite these rulings by the highest court in the land and many similar rulings by state courts, legal objections frequently have been raised against vaccination laws on grounds of religious freedom. Thus, as late as 1951, a conviction for violation of a Georgia statute requiring vaccination as a prerequsite to attendance at school was appealed on the grounds that it violated freedom of religion.[5] In upholding the law the Court of Appeals stated that, "Liberty of conscience is one thing. License to endanger the lives of others by practices contrary to statutes passed for the public safety and in reliance upon modern medical knowledge is another. . . . The opinion of defendants that they should practice healing without aid of medicine is not a legal justification for refusing to abide by the statutes of this state and regulations passed pursuant thereto, and for this reason freedom of worship was not an issue in this case." To the same effect is a New York decision of 1944.[6]

More than forty years ago the board of education of a city school in South Dakota adopted a regulation that each pupil must furnish, as a condition of

admission to school, a report of a physical examination made by a physician provided by the board or at the option of the parents. This regulation was contested by the parent of two children, who refused to permit the examination, charging among other things, that it would, "result in such mental suggestion of diseases as may result in mental disease germs," and that it was an invasion of a sacred right. The State Supreme Court held, however, that the board had the power to adopt the regulation, that the information sought was proper for the welfare of the child, that no sacred right was invaded, and that exclusion from school for failure to obey the law was on the person's own volition.[7]

In the same year, 1914, that this case was decided in favor of school hygiene, a state law requiring premarital physical examinations and recognized laboratory tests of men for venereal disease was sustained as valid by the Supreme Court of Wisconsin.[8] Several legal points were at issue in this case, including equal protection of the laws as between men and women and religious freedom. "We have not been able to appreciate the force of the contention that the law interferes with religious liberty," said the court, and "We know of no church which desires its ministers to profane the marriage tie by uniting a man afflicted with a loathesome disease to an innocent woman." Since that time laws requiring premarital examinations for venereal disease for both men and women have been adopted in most of the states, and prenatal health examination laws are likewise in effect in nearly all of the states. No such law has ever been held to be invalid by the courts.

Where a board of education made a rule excluding from school any child suffering from a contagious disease and permitting the readmission of such a child only on a physician's certificate, it was held by the Supreme Court of Minnesota in 1925 that a parent who was a Christian Scientist must abide by the rule.[9] "Many of us have to subordinate our own ideas or views to government authority," the court remarked in this case, "and the requirement calls for cooperation without requiring anyone to surrender his own views or conscientious objections thereto."

The most recent of the decisions involving requirements for physical examinations was handed down by the Supreme Court of Washington in 1952.[10] Here a regulation, originally adopted in 1941 by the university, required all students to undergo an x-ray examination of the chest for the purpose of discovering possible tuberculosis, and this examination was made a condition precedent to registration. A student who was a member of the Christian Science faith refused to have the examination and brought an action of mandamus to compel her entry to the university. In denying the petition and upholding the regulation, the court stated that the board of regents had the power to make and enforce the regulation in question, that it was a justifiable and proper health measure, that it violates no constitutional inhibition, and that the conduct of all individuals, regardless of religious belief, remains subject to regulation for the protection of society. Two justices dissented from the majority opinion on the grounds that there was lacking proof of a "clear and present danger" of tuberculosis among the students.

An individual who had been legally committed to a state sanitarium for the tuberculous in Florida brought an action of habeas corpus for his release from this alleged unlawful detention, charging that the law was unconstitutional and that, among other things, it discriminated against all persons other than those of a certain religious faith and belief. In refusing the writ and upholding the law, the Supreme Court of Florida pointed out that, "Religious

freedom can not be used as a cloak for any person with contagious or infectious disease to spread such disease because of his religion."[11]

Nor can religious freedom be used as a subterfuge for the illegal practice of medicine. Most state laws permit faith healing, subject to observance of all public health laws, but the system employed must be legitimate and not spurious. Where, for example, a clergyman claimed to have discovered that all sickness is caused by "a deficiency of life atoms" and had devised a number of peculiar instruments to overcome that deficiency, which he sold, and had established an institution where his methods were taught for a price, and patients were treated in return for "voluntary contributions," the Court of Appeals of Illinois in 1952 sustained his conviction for violation of the state medical practice act, and also for obtaining money under false pretenses.[12] This defendant, according to the court, was merely using religion as a shield for unlawful practices which were entirely mercenary and used to deceive and defraud the unfortunate and unwary. There are numerous other cases to this same effect.

Parents who refuse on religious or any other grounds to permit minor children to have necessary medical treatment may be penalized by the state, which as parens patriae may declare that such a child is neglected and may order that the treatment be given. An adult citizen, other than a member of the military forces of the United States or a ward of the government, may choose for himself any method of healing that he desires, or no method, but a child is in a different category. It is the recognized duty of the state to see to it that all minor children have proper shelter, food, clothing, education, and medical care.

A leading case on this subject is a New York decision of 1903,[13] which states the proposition that the right to practice religion freely does not include liberty to expose the community of a child to communicable disease, nor to expose the child himself to ill-health and death. The most recent of numerous other decisions to this same effect is a notable ruling in 1952 by the Supreme Court of Illinois which received considerable publicity at the time.[14] In this case an infant was born suffering from erythroblastosis fetalis, due to an Rh negative blood condition, and requiring an immediate blood transfusion to save life or prevent future mental impairment. The parent, evidently a member of Jehovah's Witnesses, refused to permit the transfusion on religious grounds. The trial court appointed a guardian for this "neglected and dependent" child, who consented to the operation, which was performed. The parent appealed.

In sustaining the action of the trial court and upholding the law, the Illinois court stated that freedom of religion and the right of parents to the care and training of their children are to be accorded the highest possible respect, but that neither rights of religion nor of parenthood are beyond limitation. Parents are free to make martyrs of themselves, but they are not free to make martyrs of their children. This court also cited a 1944 decision of the Supreme Court of the United States which upheld the conviction of a member of the sect known as Jehovah's Witnesses for permitting a minor child to sell religious literature on the streets in violation of state child labor laws.[15] The Supreme Court of the United States refused to grant a writ of certiorari to review this Illinois case of 1952, an action which in effect upholds it.

In another case concerned with the necessity of a blood transfusion for an infant afflicted with erythroblastic anemia, the Kansas City Court of Appeals stated in 1952 that a parent may follow

his own religious belief in so far as his own health is concerned, but he cannot prevent another person from receiving necessary medical attention to preserve life.[16] A minor child afflicted with rheumatic fever, who was denied treatment because of religious scruples of the parent, was turned over to the custody of the juvenile officer as a neglected child and was given the proper treatment, an action recently upheld by the Texas Court of Civil Appeals.[17] In a Mississippi case of 1951 dealing with the adoption of a child by Christian Scientists, the court stated that, "an enlightened society will not permit the great healing medium of modern medicine and surgery to be denied to children, regardless of the conscientious belief of their parents, whether such parents be natural or adoptive."[18]

Fluoridation of municipal water supplies has given rise to litigation, usually begun by Christian Scientists who consider the addition of this chemical to water as "mass medication," which, "operates to teach them to look to the physical body for health, whereas Christian Science teaches that health comes from God and true prayer makes that fact evident." Fluoridation of public water supplies at the rate of 1 ppm was initiated in this country in 1945 as a reasonable method of reducing dental caries in children. The process has been indorsed by numerous reputable scientific bodies and is now in force in about 1,000 American communities.

During 1952 the legal validity of adding suitable fluorine compounds to public water supplies came before trial courts in California, Maryland, Massachusetts, North Dakota, and Washington, and in every instance this important public health procedure was upheld as a proper exercise of the police power.[19] In 1953 there was a noteworthy decision by the Court of Common Pleas of Cuyahoga County in Ohio which also sustained the constitutionality of this process.[20] This lengthy decision is a veritable essay on the subject, discussing every legal and technical aspect of it.

In the California case a taxpayer and elector had filed an action in the Superior Court to enjoin the City of San Diego from adding fluorine compound to the city water, an action which was taken after the City Council had held a hearing and had adopted a resolution to this effect. The Superior Court found for the city and an appeal was taken to the District Court of Appeal which affirmed the decision of the lower court and upheld the validity of fluoridation.[21] Further appeal was then taken to the Supreme Court of the United States, but the highest court in the land refused to grant a writ of certiorari, an action which in effect approves the decision of the California court.

It is interesting to note in this case that witnesses opposed to fluoridation included a chiropractor and the proprietor of a so-called "health food store," while those testifying in favor included the city sanitary engineer and representatives of the local medical and dental societies. The District Court of Appeals reached the apt conclusion that the addition of fluoride to the city water was a valid exercise of the police power and that the determination of a legislative body to this effect is conclusive so long as it is reasonable. The court dismissed the contention that fluoridation was an interference with religious liberty, citing decisions of the Supreme Court of the United States which distinguish between the direct compulsion imposed upon individuals for the common good and those which are indirect or incidental to the furnishing of a service or facility.

Summary

Freedom of religion is a cardinal principle of the American system of government, but this vested right of every

citizen is not unlimited. Freedom of belief may be absolute, but freedom of action is not.

Whenever the exercise, or alleged exercise, of the right of religious liberty has come in conflict with public health laws, medical practice acts, and parental obligations to provide adequate medical care to minor children, courts of last resort in this country invariably have upheld the validity of such public health laws. Leading court decisions on these matters are cited and discussed above.

The established rule of law in the United States is that anyone can follow the tenets of any religion, but in the practice of any religious belief no one can violate federal, state, and municipal laws and regulations properly enacted and reasonably enforced in the interests of the public health and general welfare.

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Puerto Rico's Medical School

At the recent commencement of the University of Puerto Rico, the first graduating class of 45 physicians received their medical degrees from the School of Medicine. About half of the graduates will intern in the continental United States, the remainder in Puerto Rico. About two-thirds of the nearly 200 students in the four medical classes have governmental scholarships. These require the recipient to practice in a government hospital or health center, or in a small community selected by the Insular Department of Health, one year for each year of scholarship aid.

The new medical school has been fully accredited by the Council on Medical Education and Hospitals of the American Medical Association and has been admitted to affiliate membership in the Association of American Medical Colleges.

Studies of the Viability of Histoplasma capsulatum in Tap Water

CASSANDRA RITTER, F.A.P.H.A.

The single point to be tucked away in one's memory for future reference is that this organism—about which as a public health problem we are slowly fitting together the pieces—can survive for long periods in water.

The reports of surveys by many workers show that skin test sensitivity to histoplasmin is greatest in the area that includes the major water courses of the Ohio, Missouri, and Mississippi Rivers.[1-3] Kansas lies on the western edge of this area, with its largest streams in the eastern third of the state. Skin test sensitivity varies correspondingly, increasing from west to east with rates of 1.2 per cent reported for the northwest counties and 58 per cent for the east.[4, 5] These observations suggested that a study of the possible relationship between water supplies, many of which are taken from streams, and the distribution of Histoplasma capsulatum might well be made in Kansas. Numerous publications have reported isolations from soil and animals,[6-13] and have shown the importance of humidity and temperature for growth of this fungus.[14]

The problem was first approached by observing behavior of the organism when it is introduced into water under laboratory conditions. Results of studies of the survival of H. capsulatum in sterilized tap water held at different temperatures are here reported.

Methods

Tap water from the Lawrence, Kans., municipal supply was sterilized in the autoclave and used for all experiments. The source is the Kansas River, and treatment is by break-point chlorination, coagulation, and filtration. Inorganic chemical analyses of the tap water, made August, 1950, and February, 1951, show the following composition and variations:

Calcium	30.0– 32.0	ppm	
Magnesium	7.4– 8.8	"	
Iron	0.10– 0.14	"	
Manganese	– 0.00	"	
Sodium	28.0–107.0	"	
Carbonate	9.6– 18.0	"	
Bicarbonate	44.0– 52.0	"	
Sulfate	57.0–111.0	"	
Chloride	40.0–108.0	"	
Nitrate	3.4– 3.7	"	
Fluoride	– 0.3	"	
Total hardness	110.0–111.0	"	as $CaCO_3$
Carbonate hardness	52.0– 73.0	"	" "
Noncarbonate hardness	38.0– 58.0	"	" "
Total alkalinity	52.0– 73.0	"	" "
Sodium bicarbonate Alkalinity	– 0.0	"	" "
pH	8.6– 8.8		
pH after sterilization in the autoclave	7.4		

The cultures of H. capsulatum used for these studies were supplied by M. L. Furcolow, M.D. The work was done by cultural means. Media[15] used were

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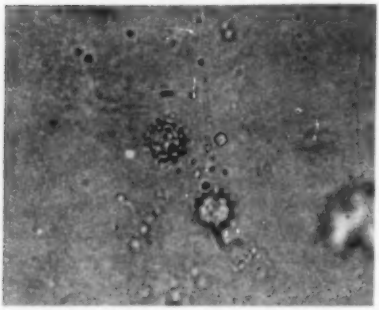
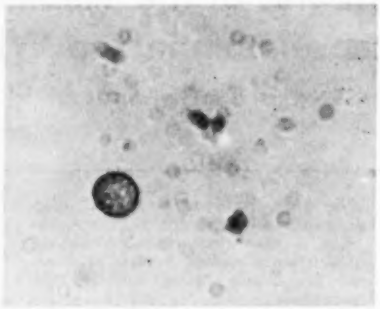
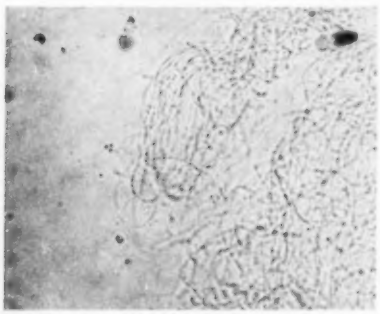
Plate 1. Histoplasma capsulatum



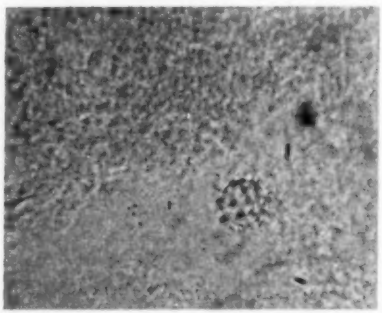
A—Tuberculate spores from culture on potato dextrose agar inoculated with mycelial phase which had survived in water held at 25° C. for 245 days.



C—Tuberculate spore from water inoculated with the yeast phase and held at 20° C. for 500 days.



B—Mycelium and small spores from water inoculated with the yeast phase and held at 25° C. for 358 days.



D—Tuberculate spore from culture recovered from mice inoculated with water in which H. capsulatum had survived 550 days at 20° C.

hemoglobin cystine agar and potato dextrose agar, to which were added 20 units per ml. of penicillin and 40 units per ml. of streptomycin, and to the potato dextrose agar 0.1 mg. per ml. of actidione in addition. The hemoglobin cystine agar was incubated at 34° C. and the potato dextrose agar at room temperature.

Four survival experiments, two using the yeast phase of H. capsulatum and two using the mycelial phase as inoculum have been made. The growth of the organism was suspended in sterile water, hemocytometer counts of the yeast cells or spores made, and three dilutions prepared. One ml. of a dilution was used for inoculating 100 ml. of sterilized tap water in a 200 ml. Erlenmeyer flask. This volume of water was subsequently maintained by the addition of sterilized tap water before any was withdrawn for tests. The viability of the original suspension and of each inoculated flask was checked by inoculations to agar plates.

Incubating temperatures for the water were selected to cover the temperature

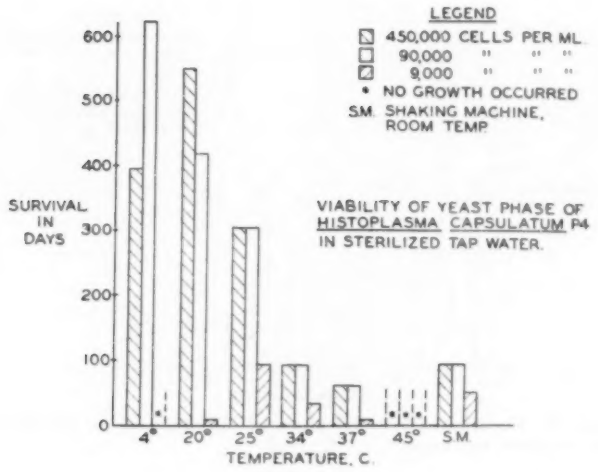


Figure 1

range encountered in nature. Seven sets of 3 flasks each were inoculated and incubated with uninoculated controls at 4° C., 20° C., 25° C., 34° C., 37° C., 45° C., and on a shaking machine at room temperature. Throughout the experiments, series of plates were inoculated at varying intervals with 0.5 ml. of water from each flask. They were observed for growth and counts made where possible. A representative colony from each potato dextrose agar plate was examined microscopically for the presence of characteristic tuberculate chlamydospores, as shown in Plate 1 (A). Typical and doubtful colonies on hemoglobin cystine agar plates were subcultured to potato dextrose agar slants and the resulting growth examined microscopically. A positive result on either type of media was considered positive for the flask.

At the termination of the experiments water from 2 flasks showing survival was confirmed by inoculation into mice. The fungus was recovered from the organs of these animals by streaking the macerated tissues on Sabouraud's agar plates. The resultant growth was examined microscopically for tuberculate chlamydospores.

Results

The results from the first experiment, using the yeast phase of culture P4 as the inoculum, are shown in Figure 1. Here are recorded the survival times in all flasks of water, inoculated with varying amounts of the fungus and held at different temperatures. Maximum survival times were: at 4° C., 621 days; 20° C., 550 days; 25° C., 306 days; 34° C., 95 days; 37° C., 62 days; and on a shaking machine at room temperature, 95 days. There was no survival at 45° C. Results from a similar experiment are comparable, showing survival after 175 days at 4° C.; 404 days at 20° C.; 252 days at 25° C.; 91 days at 34° C. and 37° C.; and 157 days on a shaking machine at room temperature.

Results from the first experiment with the mycelial phase are not presented because some of the flasks were accidentally discarded and the picture is not complete. However, survival at 20° C. after 329 days was demonstrated and

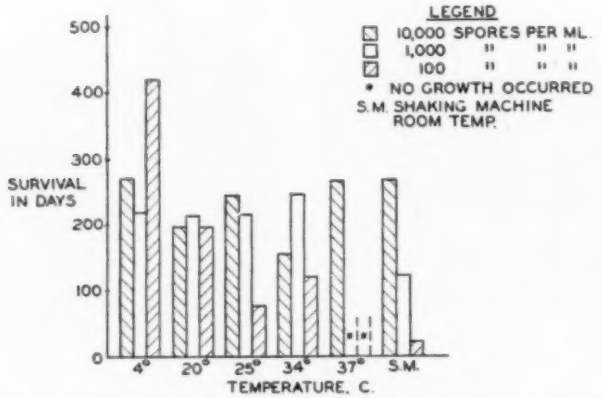


Figure 2—Viability of mycelial phase of Histoplasma capsulatum P15 in sterilized tap water.

there was no survival at 45° C. Figure 2 presents the results from the second experiment using as inoculum the mycelial phase of H. capsulatum P15. They show a maximum survival time of 421 days in water held at 4° C.; 217 days at 20° C.; 245 days at 25° C. and 34° C.; 269 days at 37° C., and at room temperature on the shaking machine. Not shown by this figure are variations in the number of colonies developing on potato dextrose agar from the flasks having the largest inoculum, which were not always the flasks showing the longest survival times. These counts are presented in Figure 3 and show that the number of colonies developing from water held at 20° C. and 25° C. was consistently higher than at other temperatures.

Two samples of water from the first yeast phase experiment were subjected to confirmation by animal inoculation. They were those held at 20° C. for 550 days and at 4° C. for 621 days. A positive culture was recovered from the mice inoculated with the first sample and typical chlamydospores demonstrated microscopically, as shown in Plate 1 (D). From the second sample, a culture that appeared typical was recovered and small tuberculate spores could be found microscopically.

One flask of water inoculated with the mycelial phase of H. capsulatum P15 was stored at a temperature below freezing. At intervals it was thawed, plates inoculated, and refrozen. Survival was observed for 198 days which included nine instances of freezing and thawing.

Triple distilled water was inoculated with the mycelial phase of strain 2474 as a control for a different experiment. After 28 days at room temperature, viable cells were recovered by culture on potato dextrose agar plates.

There was visual evidence of growth of H. capsulatum in the water held in flasks and of conversion from the yeast to the mycelial phase. Small floating or submerged masses of growth, shown by microscopic examination to be mycelium, were first observed after 2 months of incubation and became apparent in all flasks except that held below freezing. In water inoculated with the yeast phase, examination showed mycelium with small spores and a few large tuberculate spores. Water inocu-

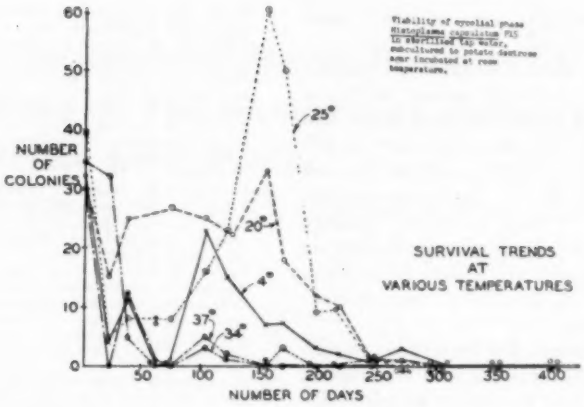


Figure 3

lated with the mycelial phase also showed mycelium with small spores and a few large tuberculate spores. Photomicrographs in Plate I (B and C) show these stages in water stored at 20° C. for 500 days and at 25° C. for 358 days.

Discussion

These experiments demonstrate a long survival time for Histoplasma capsulatum in sterilized tap water under laboratory conditions. Survival is longest at temperatures that correspond to normal outdoor temperatures: 4° C., 20° C., and 25° C. No viability was observed at 45° C., and a shortened time at 34° C. and 37° C. In the experiment using the mycelial phase as the inoculum the temperature effect is more apparent in the quantitative aspects of the results than in the elapsed time. These observations are in accord with other reports of the same relatively narrow temperature range for growth of the fungus. Aeration as provided by the flasks on the shaking machine at room temperature had no demonstrable effect.

The long survival time for H. capsulatum in sterilized tap water under laboratory conditions does not prove similar survival in water in nature, where antagonistic effects of bacteria, fungi, and other organisms must be taken into account. The evidence of survival under such adverse conditions as freezing and thawing and suspension in triple distilled water, and of conversion from the yeast phase to the mycelial phase and of growth of the mycelial phase in water, suggest that this fungus can survive and perhaps multiply in other adverse conditions such as unsterilized natural waters.

Summary

Experiments have been made to study the viability of Histoplasma capsulatum in sterilized tap water stored at temperatures corresponding to water temperatures in nature.

Survival was demonstrated by cultural means and confirmed by animal inoculation in water inoculated with the yeast phase and stored at 4° C. for 621 days and at 20° C. for 550 days. Survival was demonstrated by cultural means after 306 days at 25° C., 95 days at 34° C., and 62 days at 37° C.

No viable cells were recovered after 3 days at 45° C.

Survival after 421 days was demonstrated by cultural means in water inoculated with the mycelial phase and stored at 4° C.; after 217 days at 20° C.; 245 days at 25° C. and 34° C.; and 269 days at 37° C. There was no survival after 3 days at 45° C. Quantitative counts of colonies developing on artificial media are higher from water held at 20° C. and 25° C. than at other temperatures.

H. capsulatum has been shown to survive alternate freezing and thawing for 198 days, and to survive in triple distilled water for 28 days. Evidence of conversion from the yeast to the mycelial phase and of growth of the mycelial phase in water is presented.

ACKNOWLEDGMENT—Appreciation is expressed to Drs. M. L. Furcolow and N. P. Sherwood for their advice and encouragement; to H. A. Stoltenberg for the chemical analyses; and to Felix A. Pileggi, Ralph W. Mitchell, and Stanley Silberg for their technical assistance and enthusiastic interest.

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Kentucky Medical School Planned

The Board of Trustees of the University of Kentucky has approved the establishment of a medical school in Lexington. The plant is expected to cost about $25,000,000, some part of which will be requested by the university from the Kentucky General Assembly. The Kentucky Medical Sciences Development Foundation has been formed to build up interest in the project and to raise funds from private sources. It is expected that building plans may be completed for the start of construction in July, 1955.

Effect of Standard Water Purification Processes on the Removal of Histoplasma capsulatum from Water

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The spores of this fungus are a hardy breed. Both waterworks operators and health authorities in the regions of high histoplasmosis incidence will find much to ponder over in reported research.

Fungi in water supplies have received scant attention in recent years. It is generally believed that they cause little or no interference with present-day methods of water treatment and that there are no pathogenic fungi in water supplies. Such assumptions are open to question.

Reported studies pertaining to the fungus disease histoplasmosis include a search for the natural reservoir in nature of Histoplasma capsulatum. The isolation of this fungus from soils,[1-4] animals,[5-7] and air[8, 9] strongly suggests that it may also be present in water. This possibility is supported by the observation in the laboratory that H. capsulatum will survive for long periods of time and probably multiply in water,[10] and by the microscopic demonstration of tuberculate spores from streams by Gordon[11] and coworkers and from streams and wells by similar unpublished microscopic work of the authors.

This poses the problem of H. capsulatum in water sources and the relation of water supplies to histoplasmosis. In the eastern section of Kansas, which shows the highest histoplasmin sensitivity rate in the state,[12] the majority of the supplies are treated surface waters. Using the raw and treated water from one such surface supply, laboratory studies were made to determine the effects of standard treatment plant practices on H. capsulatum artificially introduced in water. The processes investigated included plain settling, coagulation and settling, rapid sand filtration, and chlorination.

Sedimentation Experiments—Materials and Methods

Water from the Kansas River, source of the Lawrence, Kans., raw supply, was sterilized by autoclaving in several flasks. The turbidity was 200 ppm and the pH was 6.4. Each flask was inoculated with a suspension of the mycelial phase of H. capsulatum strain 2474 such that the microscopic spore count was 5,000 per ml. Varying amounts of alum, $Al_2(SO_4)_3 \cdot 18\ H_2O$, were added and each flask shaken gently for 1 minute, after which 4 plates of potato dextrose agar, containing antibiotics to control contaminants, were inoculated with 1 ml. each. These plates provided the control colony count of the

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Table 1—Effect of Coagulation with Different Amounts of Alum in Removing Spores of H. capsulatum from Sterilized Kansas River Water

Amount of Alum (ppm)	Average Number of Colonies		
	Influent Water 0 Hours	Settled Water 2 Hours	Sediment 2 Hours
20	270	44	302
40	270	39	241
80	264	34	201
160	239	44	216
None	252	30	355

influent or water before flocculation. The flasks were agitated intermittently for 5 minutes and then allowed to stand for 2 hours at which time 4 plates each were inoculated from the supernatant or settled water and from the sediment. All plates were incubated at room temperature and counted in 6 weeks. Typical colonies were confirmed microscopically by the demonstration of tuberculate chlamydospores.

An experiment using alum and lime as coagulants was performed in the same way. The water had a turbidity of 600 ppm and a pH of 6.8. The amounts of alum and lime added were those used in the Lawrence treatment plant the day the river water was collected. At the end of 3 hours plates were inoculated from the settled water and the sediment. At that time the settled water in the test flask was clear, that in the control flask showed turbidity. After standing overnight both flasks were clear and another set of plates was inoculated.

Results

Table 1 records the results of the experiment with varying amounts of alum and Table 2 the results of using alum and lime. Both experiments show that the spores of H. capsulatum were concentrated in the sediment whether the sediment was made by the addition of chemicals or the natural settling of a turbid water. The small number of colonies developing from sediment after

Table 2—Effect of Coagulation with Lime and Alum in Removing Spores of H. capsulatum from Sterilized Kansas River Water

	Average Number of Colonies				
	Influent Water 0 Hours	Settled Water 3 Hours	Sediment 3 Hours	Settled Water 14 Hours	Sediment 14 Hours
River Water plus 15 grains per gallon of lime and 1.3 grains per gallon of alum	348	1	261	0.25	73
River water untreated	364	12	260	1	226

14 hours of settling, shown in Table 2, may be attributed to the difficulty of picking up a representative sample of sediment. The amount of alum used as coagulant had little effect, as shown in Table 1.

Filtration Experiments—Materials and Methods

Since Baylis [13] and others have demonstrated that test results of small glass tube filters follow those of larger filters, a model rapid sand filter was made from a glass tube 2 inches in diameter and 35 inches in length. Sand from the Garnett, Kans., water treatment plant with an effective size of 0.45 mm. was added in varying depths, and the entire model filter was sterilized in the autoclave. The rate of flow of the water was adjusted to 2 gallons per square foot of filter area per minute, the standard rate in water treatment plants. Tap water from Lawrence, Kans., was sterilized in the autoclave and inoculated with a suspension of H. capsulatum before filtration. Three concentrations of cells as determined by microscopic counts were used and the prepared samples filtered in sequence, the lowest concentration first, with no backwashing between filtrations.

Three sets of experiments were made using as inocula the yeast phase of H. capsulatum strain P4 and the mycelial phases of strain P15, which showed large numbers of small spores, and of strain 2474 which showed the presence of both small spores and large tuberculate spores. Potato dextrose agar and hemoglobin cystine agar all containing antibiotics to control contaminants were used for culturing the water containing the yeast phase, and potato dextrose agar only for water containing the mycelial phase. Plates were inoculated with 1 ml. of the water before and after filtration. Colonies were counted in 6 weeks and the counts averaged.

Results

In Table 3 the results of filtration through depths of sand from 3 to 30 inches are shown. No set of conditions consistently brought about complete removal. Thirty inches of sand were but little more efficient than 3 inches, suggesting that the removal of spores, yeast cells, and fragments of mycelium takes place in the upper layers of sand. There is no noticeable difference in the removal of H. capsulatum whether growing in the yeast or the mycelial phase.

Effect of Chlorine—Materials and Methods

Three preliminary experiments were made to determine the killing action of free available residual chlorine on the mycelial phase of H. capsulatum. They served to indicate effective amounts of chlorine and provide experience in using the method. The results here reported were those from the fourth experiment.

Chlorine-free, chlorine-demand-free water was prepared from distilled water by the method of Butterfield.[14] It was buffered to a pH of 7.4. All glassware was chemically clean and sterile. The chlorine source was a solution of buffered sodium hypochlorite which was made up in stock concentrations of two strengths and added in varying amounts to equal portions of water. Residuals were read by the orthotolidine "flash" method using a Hellige color comparator.

The inoculum was prepared from the 45-day old mycelial growth of H. capsulatum White strain which showed a large number of tuberculate spores. The growth was emulsified in 10 ml. of distilled water by scraping it gently from the agar slant with an inoculating loop and was homogenized in a ground glass homogenizer. One ml. of this suspen-

Table 3—The Effect of Filtration Through Various Depths of Sand on the Removal of H. capsulatum from Water

	Cells per ml.	Average Number of Colonies							
		Depth of Sand							
		3 Inches		12 Inches		24 Inches		30 Inches	
		Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent
Yeast phase, strain P4	100	..	..	..	..	2	0	6	1
	500	7	0	283	40	18	0	33	3
	1,000	24	2	TNTC *	236	30	0.1	56	7
	5,000	95	6	TNTC	TNTC	..	..	..	..
Mycelial phase, strain P15	100	..	..	..	..	19	0.1	17	0:2
	500	5	0.4	77	3	81	1	58	1
	1,000	17	1	TNTC	21	178	2	123	2
	5,000	86	3	TNTC	160	..	..	..	..
Mycelial phase, strain 2474	100	..	..	13	0.3	70	0	7	1
	500	TNTC	4	63	2	65	0	23	3
	1,000	TNTC	4	119	4	113	0.03	55	10
	5,000	TNTC	14	..	..	..	..	..	..

* Too numerous to count

sion was diluted to 100 ml. and 0.5 ml. plated on Sabouraud agar; after 6 days a colony count was made as a guide for further dilution of the inoculum. On the day of the experiment the stock cell suspension was centrifuged and resuspended in the same volume of chlorine-free, chlorine-demand-free water to reduce the chlorine demand. The inoculum used was 0.5 ml. of the cell suspension in 140 ml. of water.

The plating medium was Sabouraud agar containing 1 per cent Neopeptone, 2 per cent dextrose, and 1.5 per cent agar. Before the plates were poured antibiotics were added to the agar in the following concentrations: penicillin 20 units per ml.; streptomycin 40 units per ml.; actidione 0.1 mg. per ml.

The chlorine-free, chlorine-demand-free water was put in sterile glass-stoppered bottles in 150 ml. portions. Predetermined amounts of chlorine were added to duplicate bottles, one set to serve as controls. At zero time for the experiment chlorine readings were made on all portions; similar readings were made during the test until it was completed. The pH of the chlorine control portions was determined with a potentiometer at the beginning and termination of the tests and no change from the value of 7.4 was observed.

The standardized cell suspension was added to one set of bottles containing chlorine and a control with no chlorine. Following varying time intervals 2.0 ml. were removed from each bottle containing cells and 0.5 ml. put on each of 4 agar plates. The plates were tilted immediately until an even film covered the agar. This procedure inactivated the chlorine, as had been shown by previous experiment, and assured an even distribution of colonies. Plates were incubated at 30° C.; colonies were counted

Table 4—Average Survival of Histoplasma capsulatum Mycelial Phase When Exposed to Free Available Chlorine at pH 7.4 and Temperature 26° C.

	Exposure Time												
	0 Min.	1 Min.	3 Min.	5 Min.	10 Min.	15 Min.	20 Min.	30 Min.	45 Min.	60 Min.	2 Hr.	6 Hr.	20 Hr.
Part I													
Colonies	..	944	..	..	..	991	..	989	..	987	888	932	888
Chlorine ppm	0												
Colonies	..	..	..	929	874	889	866	829	800	891	750	714	456
Chlorine ppm:test	0.15					0.1		0.05		0	0	0	0
Chlorine " control	0.15					0.1+		0.1		0.1	0.02	0	0
Colonies	..	..	..	899	904	842	820	572	272	138	8.5	0	0
Chlorine ppm:test	0.35					0.31		0.3		0.25	0.23	0.2	0.1—
Chlorine " control	0.4					0.4		0.4—		0.35	0.32	0.3	0.1
Colonies	..	868	890	847	773	640	382	103	..	7.5	0	0	..
Chlorine ppm:test	0.6					0.5		0.45		0.4	0.38	0.35	0.25
Chlorine " control	0.7					0.7—		0.65		0.6+	0.5+	0.45	0.4
Part II													
Colonies	..	958	..	..	..	958	..	959	..	1,013	..	..	..
Chlorine ppm	0												
Colonies	..	830	780	784	598	311	97	19	..	0.5	..	..	..
Chlorine ppm:test	0.9					0.8+		0.75		0.65			
Chlorine " control	0.9					0.8+		0.8		0.75			
Colonies	..	881	918	846	188	25	8.5	2.25	..	0	..	..	..
Chlorine ppm:test	1.3					1.2		1.1		1.0			
Chlorine " control	1.35					1.35		1.3		1.2			
Colonies	..	867	777	860	25	4.5	1.5	0.25	..	0	..	..	..
Chlorine ppm:test	1.8					1.6		1.4		1.3			
Chlorine " control	1.8					1.8		1.75		1.7			

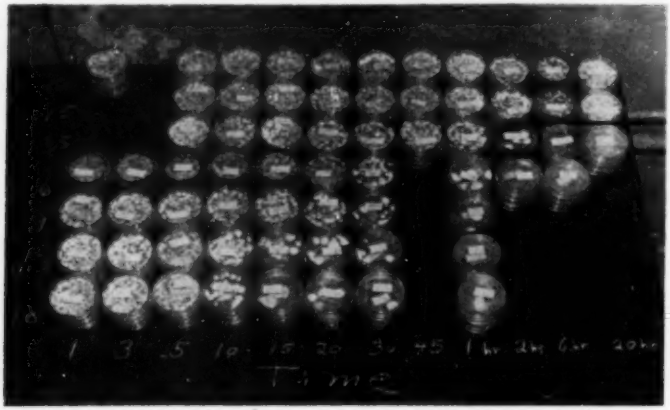

Figure 1—Photograph of plates used in chlorination experiment

in 10–14 days, and counts from the 4 plates averaged.

The experiment was performed in two parts on successive days. Separate controls were set up for each part; a fresh supply of chlorine-free, chlorine-demand-free water was used and the concentrated cell suspension was centrifuged the second day and resuspended in the new supply of water.

Results

The results of the chlorination experiment are recorded in Table 4, and are illustrated by Figure 1, a photograph of the plates, and Figure 2, a graph showing the relationship between the chlorine contact times and the logarithms of the numbers of colonies. The references to free available chlorine residuals give readings at zero time, although actually there were some decreases during the contact periods as shown in Table 4.

The portion of water treated with 1.8 ppm chlorine produced no colonies on the 4 plates after 60 minutes contact and only 1 colony on 4 plates after 30 minutes contact. An extension of the graph beyond the limits shown in Figure 2 would indicate that the minimum time in which disinfection might be accomplished under these conditions with 1.8 ppm free chlorine would be about 35 minutes.

No colonies were recovered from the 4 plates made from the water treated with 1.3 ppm free chlorine after 1 hour of exposure. Interpolation of the data by means of the semilogarithmic plot would indicate that a complete kill probably could be expected under these conditions in about 45 minutes at this chlorine dosage.

The longest contact time tested on the portion treated with 0.9 ppm free chlorine was 1 hour. The 4 plates produced 2 colonies. Projection of the curve from the data would indicate that approximately 1 hour and 45 minutes would be required for disinfection of the water with 0.9 ppm chlorine.

Disinfection with 0.6 ppm free chlorine occurred at 2 hours contact. At a dosage of 0.35 ppm free chlorine, the 4 plates made after 6 hours contact produced no colonies. Interpolation would give 4 hours as the probable minimum contact time for successful chlorination at 0.35 ppm.

The portion treated with 0.15 ppm chlorine showed very little reduction in

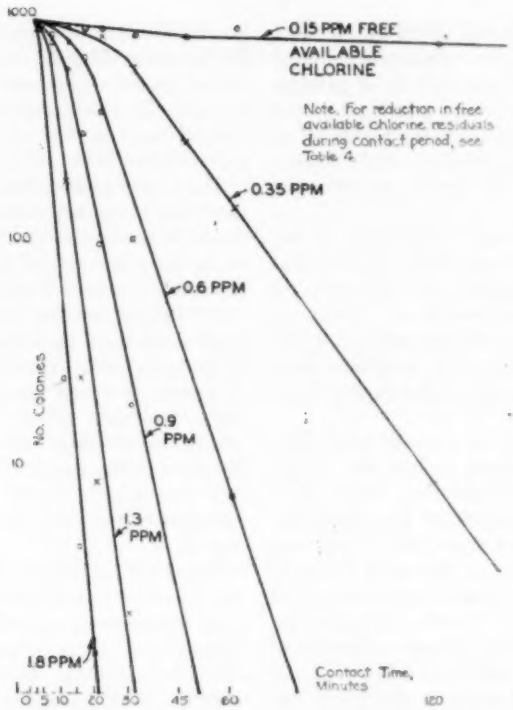

Figure 2—Effect of free available chlorine on Histoplasma capsulatum in water: mycelial phase, pH 7.4, temperature 26° C.

H. capsulatum colonies. Despite the fact that only 0.05 ppm free chlorine remained at 30 minutes and none was found by the "flash" orthotolidine method at 60 minutes, some decrease in plate counts was observed throughout the 20-hour contact period.

Referring to Figure 2, it will be noted that the logarithm of the number of colonies of H. capsulatum plotted against the contact time reasonably approximates a straight line, following an initial period of lag. This logarithmic order of death is similar to that defined in Chick's Law for the exposure of bacteria to a disinfectant. The preliminary lag in the killing of the fungus is also characteristic of resistant types of bacteria.

Discussion

The value of each of these processes differs when applied to the treatment of a raw water hypothetically infected with spores of H. capsulatum. Sedimentation is an effective tool with an efficiency paralleling that in removing soil and bacteria. The observation that spores appear to be firmly associated with the soil particles, made by Larsh, Hinton, and Furcolow [4] in a study of the flotation method for isolating H. capsulatum from soil would appear to apply here. The formation of a floc with alum serves to concentrate the soil particles.

The present trend in water works practice to provide plain sedimentation in the treatment of highly polluted or

turbid waters should afford an excellent means of securing substantial removal of H. capsulatum should it be present. In other surface water treatment plants and in lime soda softening plants using well water, coagulation and settling should also be effective in removing the fungus.

Two points which might aid in the isolation of H. capsulatum from natural waters are suggested: the formation of a floc in a water sample as a means of concentration, and the testing of the sediment from a water treatment plant as a step in isolating the fungus from a water supply.

The efficiency of a rapid sand filter in removing spores is less than might be expected, considering their large size. Measurements of H. capsulatum spores [15, 16] have shown that 73 per cent are 4.6 microns, or less, and about 10 per cent are 9.6 μ or more, as compared to 0.5–4 μ for bacteria. Possible explanations are the difficult wettability of the spores, difference in electrical charge, or differences in shape and surface texture of the cells. Of greatest significance is the finding that water filtered through 30 inches of sand was not free of spores.

On the basis of these experiments it appears that the practical effective use of free available chlorine as a fungicide against H. capsulatum in water treatment at a pH of 7.4 and at 26° C. would require a minimum free residual of 0.35 ppm and 4 hours contact, or greater dosages if the actual contact period is short, 1.8 ppm being required at 35 minutes exposure. This would provide a margin of safety since the number of spores in a natural water source could be expected to be much less than the number used in these studies. Based on the known behavior of chlorine as a bactericide, higher free chlorine residuals would be required for treatment of waters with a pH above 7.4, or at lower temperatures, and lower dosages at lower pH values or higher temperatures. Higher free chlorine residuals are required under similar conditions to kill spores of H. capsulatum than to destroy enteric bacteria [14, 17] or the virus of poliomyelitis.[18, 19]

The processes of sedimentation, filtration, and chlorination are seldom used singly in the treatment of surface water or in the softening of well waters and the combination of these processes may show different results. Such an experiment is planned, applying each method in sequence to the same sample of water. In general it would appear that surface water treatment plants and softening plants, particularly those employing break-point chlorination, sedimentation, and filtration in series, are probably effective in removing the fungus from water.

Many well waters are pumped directly into water distribution systems with only chlorination or without treatment of any kind. Chlorine contact times are short before water reaches consumers and in many instances it is doubtful whether the free chlorine residuals usually maintained are sufficient to eliminate H. capsulatum if it is present. This would also apply to treated water in uncovered reservoirs which might be contaminated by air-borne spores. While the general practice in recent years has been to cover treated reservoirs, a few remain which are subject to air-borne contamination.

Summary

The processes of coagulation and sedimentation, rapid sand filtration, and chlorination as practiced in treatment plants for surface waters have been applied in the laboratory to samples of river water or tap water sterilized and inoculated with the mycelial phase of H. capsulatum.

Sedimentation experiments showed that the settling of either natural tur-

bidity in water or a floc produced by coagulation with alum concentrated a majority of the spores in the sediment.

The model rapid sand filter did not effect a complete removal of either the yeast or the mycelial phase of H. capsulatum suspended in tap water. There was little difference in removal whether using 3, 12, 24, or 30 inches of sand.

Under the conditions of these experiments, more free available chlorine residual was required in water to inactivate H. capsulatum in the mycelial phase than to destroy enteric bacteria or the virus of poliomyelitis under similar conditions. Complete kill of an original inoculum producing approximately 950 colonies per 0.5 ml. was demonstrated with 0.35 ppm free chlorine at 6 hours contact or with 1.8 ppm at 60 minutes. Interpolation of experimental results indicated minimum effective contact times at these residuals of 4 hours, and of 35 minutes, respectively.

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Significance of "Cysts" Following Injections of Antigens

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In the course of their study the authors observed that persons who develop antigen-cysts after diphtheria immunization are usually highly immune to the disease, so they suggest that in the matter of booster doses a history of earlier cyst formation be considered as an indication that additional protection may not be needed.

In studies of multiple antigen immunization,[1, 2] 163 individuals developed 209 "antigen-cysts" out of a group of 3,464 persons who received 9,236 injections.

The term "antigen-cyst" is suggested for use in preference to the term "sterile abscess," the term "abscess" suggesting an undesirable reaction. It is felt, and this study supports the feeling, that if the abscess-like reaction is deep enough not to "break down," and in a great majority of cases is absorbed without treatment, it might not be very objectionable. The term "antigen-cyst" or "cyst of antigenic origin" is adopted because it does not connote an adverse reaction and is descriptive of a phenomenon.

We define an "antigen-cyst" as an encapsulated sac at the site of injection. It usually develops in about 7 to 10 days after injection and contains sterile pus. It has no tendency to break down unless the injection was subcutaneous or intracutaneous instead of intramuscular. Because of the impression that sensitivity factors might contribute to the formation of "antigen-cysts," this factor, as well as others, were evaluated. The following questions received careful scrutiny: Is previous antigenic inoculation a factor in the development of cysts? Which of the antigens is essentially responsible for the development of cysts? Is prolonged exposure to bacterial proteins, such as expected from multiple contacts of inmates in an institution, a factor in the development of cysts? Are dosage, age, route of administration, or heavily fat-padded arms factors in the development of cysts?

There were 3,464 persons observed in the composite multiple antigen studies and they represented the following major groups:

a. Adults in institutions	1,338
b. Children in institutions	998
Total institutional group	2,336
c. Free-living children	1,128
Total group	3,464

The occurrence of cysts among institutional and free-living groups by inoculation route and dosage is shown in Table 1.

Experiment to Determine Antigen Responsible for Development of "Antigen-Cysts"

Development of "antigen-cysts" was observed in a group of 24 adult inmates of a state hospital for the insane. The cysts occurred following the injection

Table 1—Number and Proportion of Cysts Occurring Among Institutional and Free-Living Groups with Reference to Age, Antigen Preparation, Dose, and Injection Route

No. of Antigens *	Group	Dose ml.	Injection Route	No. of Injections	No. of Persons Developing Antigen-Cysts: Under 5	6-10	11-15	Over 16	Total Number of Persons with Antigen-Cysts	Incidence of Antigen-Cysts Per cent
3	Institl.	0.5	Subcu.	1,096		3	6	25	34	3.1
	Institl.	0.5	Intram.	1,087		1	1	5	7	0.6
5	Institl.	1.0	Subcu.	278		7	3	13	23	8.2
	Institl.	1.0	Intram.	163				1	1	0.6
4	Institl.	0.5	Subcu.	0						
	Institl.	0.5	Intram.	1,529				6	6	0.4
5	Institl.	0.5	Subcu.	390	4	1	0	18	23	6.0
	Institl.	0.5	Intram.	1,751				7	7	0.4
5	Institl.	1.0	Subcu.	451	11	16	23	5	55	12.2
	Institl.	1.0	Intram.	32						0.0
1	Free-Living	0.5	Subcu.	161		3	3		6	3.7
	Free-Living	1.0	Intram.	177		1			1	0.5
3	Free-Living	0.5	Subcu.	0						
	Free-Living	0.5	Intram.	1,292						0.0
4	Free-Living	0.5	Subcu.	0						
	Free-Living	0.5	Intram.	829						0.0
Total				9,236	15	32	36	80	163	

* The multiple antigens used are described in previous publications.[1, 2]

In the above group 126 individuals had a single cyst; 28 had 2 cysts; 9 had 3 cysts, making a total of 209 cysts under study. For both the institutional and the free-living groups the proportion with cysts is markedly lower following intramuscular injection, as may be seen from Table 2 and Figure 1.

of 3- or 5-antigen preparations. The 3-antigen preparation contained diphtheria, pertussis, and scarlet fever antigens. The 5-antigen preparation contained tetanus and typhoid antigens in addition. Therefore, the antigen or antigens responsible for the development of cysts was present in both the 3- and the 5-antigen preparations. In order to determine what was responsible for the formation of "antigen-cysts" in the 3-antigen preparation, the third injection was given subcutaneously to each of the above 24 patients, but individual antigens from the same multiple preparations were injected at different sites. Also, 1.0 ml. alum suspension was separately injected in the same concentration as used in the alum-precipitated preparations. "Antigen-cysts" were formed in 15 of 24 persons thus injected. All of these developed at the site of diptheria toxoid injections.

Factors relating to "antigen-cyst" de-

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This study was made possible by an annual grant by E. R. Squibb & Sons which also provided all biologic preparations.

Table 2—Summarization of Data in Table 1 by Route of Administration

Group	Route	No. of Injections	Antigen-Cysts	
			Number	Per cent
Institutional	Subcutaneous	2,215	135	6.1
Institutional	Intramuscular	4,562	21	0.46
Free-Living	Subcutaneous	161	6	3.7
Free-Living	Intramuscular	2,298	1	0.04
Total		9,236	163	

velopment in the 24 tested individuals are found in Table 3 and may be summarized as follows:

A. Cysts after the first injection developed in 19 persons
B. Cysts after the second injection developed in 9 persons
C. Cysts after the third injection developed in 15 persons
   9 of the group had one "antigen-cyst" in the course of 3 injections
   13 had 2 "antigen-cysts" in the course of 3 injections
   3 had 3 "antigen-cysts" in the course of 3 injections

All pus specimens were aspirated and were found sterile at the Squibb Laboratories or at the Herman Kiefer Hospital, or both.

Of the 9 who did not show cysts after the injection of the individual antigens, 6 had previously received the triple antigen. We realize that our results do not prove that a combination of any 2 or all 3 of the antigens would not again have given them a cyst formation. The remaining 3 who showed no cysts following the injection of the individual antigen had previously received 5-antigen injections. The results cited here do not prove that tetanus toxoid or typhoid antigen, or both together, would not have caused cysts in these 3, but the

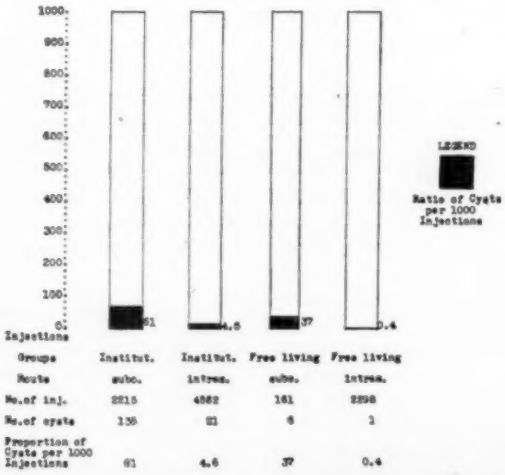

Figure 1—Proportion of antigen-cysts among institutional and free-living groups.

Table 3—Data on a Special Group of 24 Persons with "Antigen-Cysts"

Case No.	Previous Schick or Immunization History	Pre-Injection Titer Unit	First Injection				Second Injection				Third Injection				Post-Injection Titer
			No. of Antigens	Dosage ml.	Antigen Cysts	Day Aspirated	No. of Antigens	Dosage ml.	Antigen Cysts	Day Aspirated	No. of Antigens	Dosage ml.	Antigen Cysts	Day Aspirated	
170	Sch. neg.	0.1	3	0.5	X	7	3	0.2	X	9	Spec.	0.5	..		>1.0
119	1937	1.0	3	0.5	X	8	3	0.2	..		Spec.	0.5	X	7	..
352	1933	0.1	3	0.5	X	7	3	0.2	..		Spec.	0.5	..		>1.0
302	Sch. neg.	0.1	3	0.5	X	14	3	0.2	..		Spec.	0.5	X	7	>1.0
364	Sch. neg.	0.01	3	0.5	X	14	3	0.2	..		Spec.	0.5	..		..
382	Sch. neg.	0.1	3	1.0	X	7	3	0.4	..		Spec.	1.0	X	5	>1.0
401	Sch. neg.	>1.0	3	1.0	X	8	3	0.4	..		Spec.	1.0	X	9	>1.0
129	Unknown	<0.001	3	1.0	X	15	3	0.4	..		Spec.	1.0	..		<0.001
133	Unknown	1.0	3	1.0	X	15	3	0.4	X	9	Spec.	1.0	X	7	>1.0
138	Unknown	1.0	3	1.0	X	15	3	0.4	X	9	Spec.	1.0	X	8	..
261	1937	0.1	3	1.0	X	14	3	0.4	..		Spec.	1.0	X	8	>1.0
183	Sch. pos.	0.001	3	1.0	X	10	3	0.4	..		Spec.	1.0	X	6	>1.0
191	Unknown	>1.0	5	0.5	X	10	5	0.2	..		Spec.	0.5	..		>1.0
279	Sch. pos.	1.0	5	0.5	X	6	5	0.2	..		Spec.	0.5	..		>1.0
156	1938	0.01	5	0.5	X	15	5	0.2	..		Spec.	0.5	..		>1.0
272	Unknown	<0.001	5	0.5	X	14	5	0.2	X		Spec.	0.5	X	6	>1.0
422	Sch. neg.	0.1	5	0.5	X	15	5	0.2	..		Spec.	0.5	X	6	>1.0
469	Unknown	<0.001	5	1.0	X	8	5	0.2	X	9	Spec.	1.0	X	8	0.1
141	Sch. neg.	1.0	3	1.0	..		3	1.0	X	10	Spec.	1.0	..		>1.0
184	Sch. doubtful neg.	n.e.s.*	3	1.0	..		3	1.0	X	9	Spec.	1.0	..		>1.0
186	Unknown	n.e.s.†	3	1.0	..		3	1.0	X	9	Spec.	1.0	X	8	>1.0
190	Sch. neg.	>1.0	5	0.5	..		5	0.5	X	9	Spec.	0.5	X	9	>1.0
465	Unknown	0.1	5	1.0	..		5	1.0	X	9	Spec.	1.0	X	9	0.1
512	Unknown	0.1	5	1.0	X	9					Spec.	1.0	X	5	..

* n.e.s.—Not enough serum for titration.

† Special-injection with separate antigens (diptheria, scarlet fever, pertussis antigens; also, alum solution).

Table 4—Analysis of Individuals Who Developed Two "Antigen-Cysts" Following Inoculations of Multiple Antigen Preparations

			First Injection					Second Injection					Third Injection				
Case No.	Previous Schick or Immunization History	Pre-injection Titer	Injection Route	No. Antigens	Dosage ml.	Antigen-Cysts	Day Aspirated	Injection Route	No. Antigens	Dosage ml.	Antigen-Cysts	Day Aspirated	Injection Route	No. Antigens	Dosage ml.	Antigen-Cysts	Day Aspirated	Post-Injection Titer
170	Sch. neg.	0.1	Subcu.	3	0.5	X		Subcu.	3	0.2	X		Subcu.	Spec.	0.5	0		>1.0
119	1937	1.0	Subcu.	3	0.5	X		Subcu.	3	0.2	0		Subcu.	Spec.	0.5	X		
302	Sch. neg.	0.1	Subcu.	3	0.5	X		Subcu.	3	0.2	0		Subcu.	Spec.	0.5	X		>1.0
382	Sch. neg.	0.1	Subcu.	3	0.5	X		Subcu.	3	0.4	0		Subcu.	Spec.	1.0	X		>1.0
401	Sch. neg.	>1.0	Subcu.	3	0.5	X		Subcu.	3	0.4	0		Subcu.	Spec.	1.0	X		>1.0
261	1937	0.1	Subcu	3	1.0	X		Subcu.	3	0.4	0		Subcu.	Spec.	1.0	X		>1.0
183	Sch. pos.	<0.001	Subcu.	3	1.0	X		Subcu.	3	0.4	0		Subcu.	Spec.	1.0	X		>1.0
272	Unknown	<0.001	Subcu.	5	0.5	X		Subcu.	5	0.2	0		Subcu.	Spec.	0.5	X		>1.0
422	Sch. neg.	0.1	Subcu.	5	0.5	X		Subcu.	5	0.2	0		Subcu.	Spec.	0.5	X		>1.0
186	Unknown	..	Subcu.	3	1.0	0		Subcu.	3	1.0	X		Subcu.	Spec.	0.1	X		>1.0
190	Sch. neg.	>1.0	Subcu.	5	0.5	0		Subcu.	5	0.5	X		Subcu.	Spec.	0.5	X		>1.0
465	Unknown	0.1	Subcu.	5	1.0	0		Subcu.	5	1.0	X		Subcu.	Spec.	1.0	X		0.1
512	Unknown	0.1	Subcu.	5	1.0	X							Subcu.	Spec.	1.0	X		..
707	Sch. pos.	>1.0	Subcu.	3	1.0	X	7	Subcu.	3	0.5	X	7	Subcu.	3	0.5	0		>1.0
1083	Sch. pos.	<0.001	Subcu.	5	1.0	X	8	Subcu.	5	1.0	X	9	Subcu.	5	1.0	0		>1.0
1094	Sch. pos.	0.01	Subcu.	5	1.0	X	8	Subcu.	5	1.0	X	11	Subcu.	5	1.0	0		>1.0
1802	1931	..	Subcu.	3	0.5	X	8	Intram.	3	0.5	X	8	Subcu.	4	0.5	0		..
1809	Sch. neg.	..	Subcu.	3	0.5	X	8	Intram.	3	0.5	X	10	Intram.	4	0.5	0		..
1810	Sch. neg.	..	Subcu.	3	0.5	X	8	Intram.	3	0.5	X	7	Intram.	4	0.5	0		..
2249	Unknown	>1.0	Intram.	3	0.5	X	9	Intram.	3	0.5	0	0	Intram.	3	0.5	X	8	..
1801	Unknown	..	Intram.	4	0.5	X	9	Intram.	4	0.5	0	0	Intram.	4	0.5	X	14	..
1812	Unknown	..	Subcu.	5	0.5	X	9	Intram.	5	0.5	0	0	Intram.	5	0.5	X	14	>1.0
1818	Unknown	>1.0	Subcu.	5	0.5	X	9	Intram.	5	0.5	X	11	Intram.	5	0.5	0		..
2023	Unknown	..	Subcu.	5	0.5	X	9	Intram.	5	0.5	0	0	Intram.	5	0.5	X	14	>1.0
903	Unknown	..	Subcu.	5	1.0	X	7	Subcu.	5	1.0	0	0	Subcu.	5	1.0	X	4	Free-Living
1026	Unknown	<0.001	Subcu.	5	1.0	X	8	Subcu.	5	1.0	0	0	Subcu.	5	1.0	X	11	..
1042	1943	<0.001	Subcu.	5	1.0	X	8	Subcu.	5	1.0	X	7	Subcu.	5	1.0	0		..
3523	Sch. pos.	..	Intram.	3	0.5	0		Intram.	3	0.5	X	8	Intram.	3	0.5	X	8	>1.0

number who did show cysts after the injection of alum precipitated diphtheria antigen suggests that this is by far the most important causative agent. That alum precipitated tetanus toxoid will seldom cause "antigen-cysts" in free-living children, if given intramuscularly, is indicated by the fact that not one of the 1,292 children receiving 3 intramuscular injections of a triple antigen of alum precipitated diphtheria and tetanus toxoid and pertussis vaccine developed cysts.

Incidence of Multiple Cysts Following Inoculations

In a footnote to Table 1 it is stated that among the entire inoculated group herein reported, 28 individuals had 2 cysts and 9 had 3 cysts following inoculations. Tables 4 and 5 give detailed information of individuals who developed 2 or 3 cysts with data pertaining to the history of previous inoculation, the preinjection titer, dosage, the number of antigens used, and the postinjection titer, among others.

As may be seen from a study of Tables 4 and 5, 20 of 37 cases either had a history of previous inoculation, a Schick-negative test or a high preinjection titer. Titrations were made on 25 individuals within 4–6 months following inoculation; of these 23 had more than 1.0 unit of diphtheria antitoxin and 2 had 0–0.1 unit.

In the group there were 5 persons having less than 0.001 of a unit prior to inoculation. Of these, 4 had more than 1.0 unit following inoculation, and one had 0.1 unit. This extremely strong antigenic response suggests that the 5 individuals could be added to the group of 20 which had been classified by us as having been inoculated previously.[3]

Incidentally, among the entire group (37 persons) there was only one who was free-living; the remainder were institutionalized and had received inoculations by the subcutaneous route.

The following is the summary from Tables 4 and 5 which deals with a group of 37 individuals having developed more than one "antigen-cyst" following inoculations.

Table 5—Analysis of Individuals Who Developed Three "Antigen-Cysts" Following Inoculations of Multiple Antigen Preparations

				First Injection				Second Injection				Third Injection				
Case No.	Previous Schick or Immunization History	Preinjection Titer	Injection Route	No. of Antigens	Dosage ml.	Antigen-Cysts	Day Aspirated	No. of Antigens	Dosage ml.	Antigen-Cysts	Day Aspirated	No. of Antigens	Dosage ml.	Antigen-Cysts	Day Aspirated	Postinjection Titer
133	Unknown	1.0	Subcu.	3	1.0	X		3	0.4	X		Spec.	1.0	X		>1.0
138	Unknown	1.0	Subcu.	3	1.0	X		3	0.4	X		Spec.	1.0	X		..
469	Unknown	<0.001	Subcu.	5	1.0	X		5	0.2	X		Spec.	1.0	X		0.1
1020	Unknown	1.0	Subcu.	5	1.0	X	7	5	1.0	X	5	5	1.0	X	7	>1.0
1035	Schick-Positive	<0.001	Subcu.	5	1.0	X	8	5	1.0	X	7	5	1.0	X	11	>1.0
1811	Unknown	..	Intram.	4	0.5	X	8	4	0.5	X	8	4	0.5	X	8	>1.0
1987	Unknown	..	Subcu.	5	0.5	X	8	5	Intram. 0.5	X	8	5	Intram. 0.5	X	11	>1.0
2114	Unknown	..	Subcu.	3	0.5	X	10	3	Intram. 0.5	X	6	4	Intram. 0.5	X	8	>1.0
1814	Unknown	..	Intram.	5	0.5	X	8	5	Intram. 0.5	X		5	Intram. 0.5	X	8	>1.0

Table 6

Injection Route	First Injection	No. of Antigen-Cysts Developed	Second Injection	No. of Antigen-Cysts Developed	Third Injection	No. of Antigen-Cysts Developed
Subcutaneous	32	29	24	14	25	19
Intramuscular	5	4	12	8	12	9
Total	37	33	36	22	37	28

The information presented in Table 6 has no bearing on the significance of the route of injection. This topic will be discussed elsewhere in relationship to the entire group studied.

In general it may be stated that the history of inoculation and antigenic response was not different whether the individuals had one, 2, or more "antigen-cysts" following inoculation.

Significance of Previous Immunization

To determine whether previous immunization may be a factor in the development of "antigen-cysts," the immunization history of the "antigen-cyst" group of 163 persons was studied. Prior inoculation was determined in 80 per cent of the individuals, and in the remaining instances such a history could not be obtained. In these circumstances the immune status was determined whenever possible by the Schick test or by diphtheria antitoxin titration prior to injection of antigens.

All except one of those showing "antigen-cysts" responded promptly to the antigen injection, and 90 per cent developed a titer of one or more diphtheria antitoxin units per ml. of blood. This type of response would not have occurred in a nonimmunized group,[3-5] and for this reason it appears that the entire group was previously immunized even though the history is not obtainable in some cases. It should be kept in mind that the entire group was living in institutions in close contact with other inmates, and therefore it is quite possible that some individuals developed immunity through exposure to diphtheria carriers. Blood titrations were carried out on 107 of the group of 163 individuals and the results are found in Table 7.

From a study of Table 7 it will be noted that the majority of individuals had a high diphtheria antitoxin titer at injection, or that persons who did not show any detectable antitoxin at the time of injection responded promptly and markedly to antigenic stimulation. This in itself suggests that these persons were previously inoculated. The conclusion made as a result of these observations is that the development of "antigen-cysts" tend to occur in highly immunized persons or those antigenically highly responsive, and however

Table 7—Pre- and Postinjection Titers of Persons Who Developed "Antigen-Cysts"

Preinjection Titer					Postinjection Titer				
<0.001	<0.001–0.01	<0.01–0.1	0.1–<1.0	1.0 or more	<0.001	0.001–<0.01	0.01–<0.1	0.1–1.0	1.0 or more
30	4	14	19	40	1	..	..	8	86

Table 8—Dosage and Development of Cysts

Incidence of Cysts in Several Groups of Institutional Inmates Receiving 0.5 ml. and 1 ml. of Multiple Antigen Preparations

Intramuscular Group					Subcutaneous Group				
No. of Antigens	No. of Injections	Dosage ml.	No. with Cysts	Incidence Per cent	No. of Antigens	No. of Injections	Dosage ml.	No. with Cysts	Incidence Per cent
3	1,087	0.5	7	0.6	3	1,096	0.5	34	3.1
3	163	1.0	1	0.6	3	278	1.0	23	8.2
4	1,529	0.5	6	0.4					
5	1,751	0.5	7	0.4	5	390	0.5	23	6.0
5	32	1.0	0	0.0	5	451	1.0	55	12.2
Total	4,562		21			2,215		135	

The above findings are summarized in Figure 2.

unpleasant it is to have an "antigen-cyst," nevertheless, such individuals should be considered as possessors of a high degree of immunity against diphtheria.

The observations that highly immunized groups are more apt to develop "antigen-cysts" suggests that this reaction perhaps might be due to sensitization of the person to diphtheria proteins. The fact that reactions develop about the eighth day, a period which is usually required for the development of a serum reaction, suggests that a sensitivity factor should be considered of some significance in the development of "antigen-cysts."

Importance of Dosage in the Development of Cysts

To determine further the importance of dosage in the development of "antigen-cysts," the group of 25 institutional

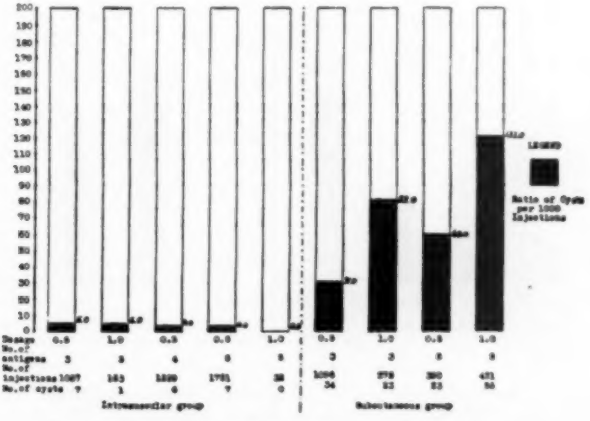

Figure 2—Dosage and development of antigen-cysts.

Table 9—Relationship of Age to Incidence of "Antigen-Cysts" Among Persons Receiving Multiple Antigen Preparations

Age Group	Institutional Group—2,336 Persons				Free-Living Children—1,128			
	No. of Injections	Proportion of Group Per cent	No. of Cysts	Proportion of Cysts Per cent	No. of Injections	Proportion of Group Per cent	No. of Cysts	Proportion of Cysts Per cent
Under 5	326	4.8	15	10.0	306	12.4	0	0.0
6–10	1,758	25.9	28	18.0	1,337	54.4	4	57.0
11–15	1,043	15.3	33	21.0	797	32.4	3	43.0
16 and over	3,650	54.0	80	51.0	19	0.8	0	0.0
Total	6,777	100.0	156	100.0	2,459	100.0	7	100.0

Total injections—9,236.
Total number of persons developing "antigen-cysts"—163.

adults received varying doses of multiple antigen preparations for the second injection. The results are summarized as follows:

Eleven persons received 0.2 ml. of multiple antigen preparations by the subcutaneous route; 2 persons developed "antigen-cysts"; 5 persons received 0.4 ml. of multiple antigen preparations by the subcutaneous route; 2 persons developed "antigen-cysts"; 5 persons received 1.0 ml. of multiple antigen preparations by the subcutaneous route; 5 persons developed "antigen-cysts."

It is apparent that the dosage is important in contributing to the development of "antigen-cysts" following sub-

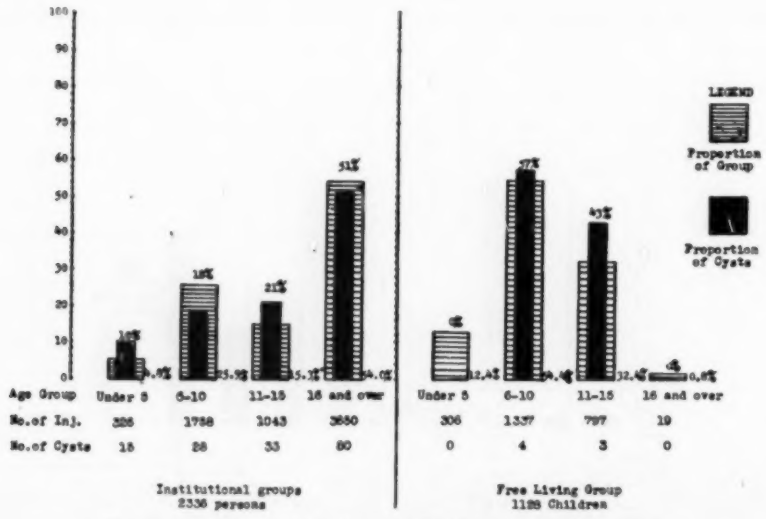

Figure 3—Relationship of age to incidence of antigen-cysts.

Table 10—Effect of Living Status of Children on Occurrence of Cysts

Injection Route	Status	No. in Group	No. of Cysts	Per cent with Cysts	No. of Inoculations	Cysts per 100 Inoculations
Intramuscular	Institutional	1,520	21	1.38	4,562	0.46
Intramuscular	Free-living	967	1	0.10	2,298	0.04

It is to be noted that the development of "antigen-cysts" in the institutional groups is 11 times as prevalent as among the free-living children.

cutaneous injection, and although smaller doses minimize the incidence they do not prevent the occurrence.

Significance of Age in the Development of Cysts in Institutional and Free-Living Groups

It appears from Table 9 and Figure 3 that age may be a factor in the development of "antigen-cysts" in both the subcutaneous and intramuscular route groups, but the significance is not clear-cut. It would be anticipated that cysts would be more frequently observed in the older age groups because such a factor as more frequent contacts with cases or carriers among others would be operative.

Effect of Living Status of Children on Occurrence of Cysts

In this study there are 2 large groups of individuals who received intramuscular injections. One, the institutional group, and the other the free-living group. A comparison of the 2 groups is shown in Table 10 and Figure 4. It is readily apparent that the incidence of cysts is much higher in the institutional group than among the free-living group.

In discussing factors which are responsible for the development of "antigen-cysts," it has been mentioned that cysts are more frequently encountered in institutionalized individuals than among free-living children of the populations here studied. Perhaps exposure to diphtheria organisms is greater among institutional groups because the contact among them is more intimate. If previous immunization has been a factor in the development of "antigen-cysts" this, in our opinion, suggests that sensitization is operative. If the above assumption is correct it is logical then to presume that institutional groups will show a higher degree of sensitivity than a group of nonimmunized free-living children.

In a group of free-living children who received 2,298 injections by the intramuscular route, we found one who de-

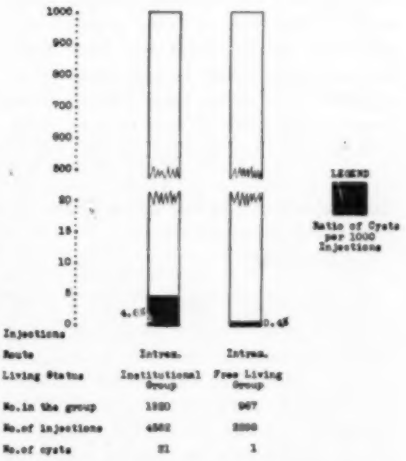

Figure 4—Effect of living status on occurrence of antigen-cysts.

veloped an "antigen-cyst." This compared with the group of institutionalized children who received 4,562 injections by the intramuscular route, among whom 22 "antigen-cysts" developed.

Significance of the Route of Administration in the Development of "Antigen-Cysts"

The route of administration appears to be of great significance (Table 8 and Figure 2). That the route of administration is not the only factor is indicated by the fact that in some groups "antigen-cysts" were many times higher in occurrence than in others receiving injections by the same route. This can be seen in Table 2 and Figure 1. In studying the entire institutional group it will be noted that 141 "antigen-cysts" developed following 2,172 subcutaneous injections, and only 22 cysts following 4,562 intramuscular injections which represents an incidence of 6.0 per 100 injections by the subcutaneous route and 0.5 cysts per 100 injections by the intramuscular route.

Possible explanations for the differences are: That multiple antigen preparations injected into the muscles are absorbed quicker with less local reaction; muscle tissue is less sensitive to diphtheria proteins than subcutaneous tissue; and depth of injection on occasion obscures recognition of the cyst.

Does Injection into Fat Tissue Contribute to Development of "Antigen-Cysts"?

An attempt was made to test our impression that overweight might be a factor in the development of "antigen-cysts." Injections of multiple antigen preparations were usually given with a one-inch hypodermic needle, and in many instances, the needle was not long enough to penetrate through the subcutaneous fat layer into muscle. It is presumed that if multiple antigen preparations are injected into fat tissue, absorption will be slower and that deposit of multiple antigen preparations containing alum suspension may be a greater irritant to fat than to muscle tissues.

The following data are of interest in this connection: In 51 persons with "antigen-cysts," 29, or 57 per cent were overweight by 10 per cent or more. (Wood's chart was used as a guide for determining normal weight, underweight, and overweight.) In 7 instances (14 per cent) cysts occurred in persons who were underweight by 10 per cent, or more. The balance of 15 persons (29 per cent) was within normal weight limits.

These data lend credence to the impression, but no weight study was made of children not developing "antigen-cysts" (control population). However, it appears to be safer and more expedient to inject antigens deep into muscle tissue and minimize the frequency of "antigen-cysts."

Comments

The "antigen-cyst" may be a strong antigenic stimulant. Moloney and his coworkers [6, 7] found definite relationship between reactions following toxoid inoculations and immunological response. However, the study suggests that a person who develops an "antigen-cyst" had a state of immunity which made reinoculation unnecessary. Cyst formation is probably a sensitivity reaction, and is the result of a high level immunity status and not the cause of it. In other words, it is a sensitivity reaction as well as an antigenic one.

Summary

The following factors probably are important in the development of "antigen-cysts":

1. Previous inoculation against diphtheria apparently sensitizes a person to bacterial protein and favors production of cysts.

2. Individuals in institutions are more apt to become sensitized and probably to a greater degree than free-living individuals due to the more intimate contact of the former with fellow inmates.

3. Adult groups are apt to be more sensitized because of longer opportunity for exposure to diphtheria organism proteins.

4. Dosage of alum precipitated antigens may be an important factor in the occurrence of cysts. Both the amount of antigen and the time required for its absorption may be factors contributing to the fact that 1 ml. subcutaneous injections were found to result in cysts more frequently than 0.5 ml. subcutaneous injections.

5. The subcutaneous route of injection appears to be an important factor in contributing to the frequency of "antigen-cysts."

6. Persons developing "antigen-cysts" appear to be possessors of a high degree of immunity against diphtheria. It may be that recording by the health department and physicians of cases developing "antigen-cysts" may be worth while in order that such persons may not receive unnecessary booster injections and thus prevent repetition of "antigen-cyst" development.

ACKNOWLEDGMENT—We gratefully wish to acknowledge the technical assistance and untiring efforts of Maud G. Gilbert, R.N., in the field work; Dorothy McInerney of the secretarial staff; and Dr. August Holm of E. R. Squibb & Sons' laboratory staff, in performing the laboratory tests.

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Standards of Eligibility for Premature Infant Care

The Massachusetts Department of Public Health has sent to all local boards of health and hospital superintendents suggested principles for determining eligibility of families for financial assistance in the care of premature infants. An over-all principle is that each case be considered on an individual basis. Other suggestions are:

1. Families should not be forced to a lower standard of living in basic matters.

2. Ownership of property does not disqualify a family unless the equity is a large amount.

3. Personal property not exceeding $300 should not be considered in determining the financial ability of a family to pay for care of premature infants.

4. Families should not be asked to sell property already purchased, such as an automobile, electric refrigerator, television set, radio, etc.

5. The following items should be evaluated and considered: amount of current indebtedness in relation to purpose for which incurred, obligation to care for other dependents, regularity of employment and recent unemployment, and physician's estimate of length and expense of care.

6. Suggested annual incomes at or below which families should be considered for financial aid are $3,180 for a couple with no other children, up to $5,750 for a couple with four other children, and an added $420 for each additional child.

Bacteriophage Active Against Virulent Mycobacterium tuberculosis
I. Isolation and Activity

SEYMOUR FROMAN, Ph.D.; DRAKE W. WILL; and EMIL BOGEN, M.D., F.A.P.H.A.

Though the classification of tubercle bacilli on the basis of phage susceptibility is not yet practical—as indicated here—the differentiation of strains of human tubercle bacilli by the use of phages offers promising possibilities in the bacteriology and epidemiology of tuberculosis.

Bacteriophages which lyse saprophytic acid-fast bacilli have been isolated and reported by several investigators during the past six years.[1-7] No reference, however, to a bacteriophage active against Mycobacterium tuberculosis has been found in the literature. Steenken [8] in 1938 reported spontaneous lysis of old cultures of human tubercle bacilli in a highly acid medium, but the active agent present in the filtrate was not propagated and it was not suggested that this phenomenon was produced by bacteriophage.

In a preliminary report,[9] the isolation of two bacteriophages active against the tubercle bacillus was described. These studies were part of an investigation of the applicability of bacteriophage typing for the differentiation of acid-fast bacilli. This paper presents a fuller description of the isolation and activity of four of these lytic agents.

Methods

Glassware—All glassware was acid-cleaned, rinsed in 2 per cent $NaHCO_3$ solution and triple-rinsed in distilled water.

Media—

1. Stock culture maintenance: glycerol egg yolk medium.[10]
2. Basal plating medium: Bordet-Gengou agar base with proteose peptone—Difco (BGB).
3. Semisolid layering medium: (0.8 per cent agar).

Bordet-Gengou broth base *—Difco (experimental)	12.6 gm.
Bordet-Gengou agar base—Difco (BGB)	16.0 gm.
Glycerol, C. P.	10.0 ml.
Distilled water	1,000 ml.

Melted, tubed in 3 ml. amounts, and autoclaved at 15 pounds pressure for 20 minutes.

4. Bacteriophage stock culture and fluid enrichment medium: heart infusion broth—Difco (HIB).
5. Stock culture fluid medium: Tween-albumin liquid medium.[11]

Cultures—Four hundred and forty-two strains of acid-fast bacilli of avirulent, virulent, and saprophytic types were used. Each bacteriophage isolated in this laboratory or received from other workers was given an accession number preceded by a D. Each strain of bacillus was similarly accessioned, the number preceded by an F.

Preparation of Seeded Agar-Layered Petri Plates and Bottles—A modification of Gratia's agar layer method [12] was used for demonstrating lysis of

* The Bordet-Gengou Broth Base, experimental, was kindly supplied by the Difco Laboratories, Inc., Detroit, Mich.

acid-fast bacilli. Petri plates were layered with 15–18 ml. of BGB medium and dried at room temperature overnight. A test tube of semisolid agar, melted and maintained at 50–53° C. in a water bath, was inoculated with approximately 0.2–0.3 ml. of a turbid bacterial culture. The semisolid agar was quickly poured over the basal layer of BGB and evenly distributed. After solidification, the plates were ready to be inoculated with phage.

Prescription bottles (6–8 ounces) were used for studying pathogenic mycobacteria. The bottles, cotton plugged, were layered with 30–40 ml. of BGB and thoroughly dried at 20–37 ° C. for 96 hours or longer. Approximately 0.5 ml. of fluid culture was added and evenly spread over the surface by tipping the bottle or with an inoculating loop. After 24–72 hours of incubation to allow absorption of the fluid medium, the cotton plugs were replaced with sterile plastic screw caps. The bottles were then ready to be spotted with phage. When the agar layer method was applied to the pathogens, the organisms were inoculated directly into the bottles as previously described. The melted semisolid agar was then poured into the bottles and quickly and thoroughly mixed with the inoculum and allowed to solidify. All culture incubation was at 37° C.

Isolation of Bacteriophage—A modification of the soil enrichment technic of Gardner and Weiser[1] was used. Samples of soil were obtained from a flower bed, an alfalfa field, and a stable. Enrichments were carried out on 100 gm. samples contained in wide-mouthed sputum jars.

Several different saprophytic organisms, arbitrarily selected, were heavily inoculated from stock cultures on solid media into 50 ml. of HIB in 8-ounce prescription bottles. The bottles were slanted to allow maximum surface growth and incubated at 37° C. for from 7 to 10 days. These mixed cultures were harvested by centrifugation, washed twice in distilled water, and resuspended in sufficient distilled water so that 10–20 ml. of a dense suspension could be added to each of the soil samples. Similar enrichments of the incubating soil samples were made twice weekly for 3 weeks. Four days after the last enrichment, 10–15 ml. of the soil suspension was centrifuged and the supernate filtered through an ultrafine sintered glass filter (Corning). A drop of each of the soil filtrates was spotted on plates previously seeded with each of the organisms used in the enrichments.

When virulent tubercle bacilli were used for enrichment experiments, the above procedures were modified. A number of different strains of either saprophytic organisms or pathogenic organisms were heavily suspended from stock cultures on solid media into 20 ml. of Tween-albumin medium. After thoroughly dispersing the inocula by shaking, approximately 0.5 ml. of the mixed bacterial suspension was spread over the surface of BGB in 6- or 8-ounce bottles. Saprophytic cultures were incubated for 7–14 days, pathogenic cultures for 21–42 days. The agar surfaces were then flooded with 10–20 ml. of sterile distilled water and permitted to remain at room temperature for 2–3 hours; when necessary, the organisms were freed from the agar surface with an applicator stick. The bacterial suspensions were poured carefully into the

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This paper was presented before the Laboratory Section of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 12, 1953.

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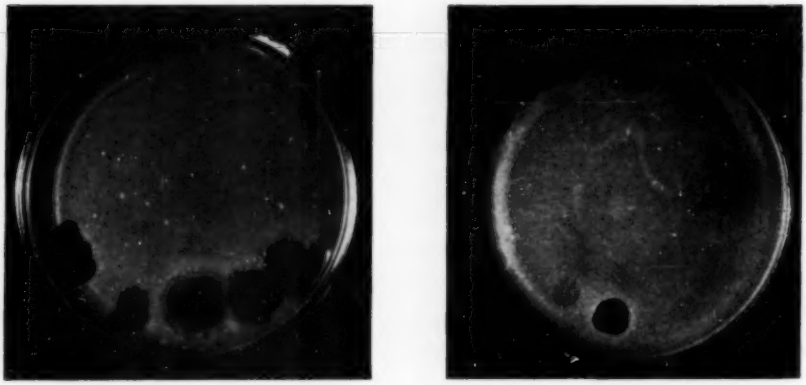


A B

Figure 1—Primary isolation of mycobacteriophage from soil filtrates.
A—Five plaques observed on Mycobacterium friedmannii (F 16).
B—Two plaques observed on Mycobacterium smegmatis (F 5).

soil sample which was incubated at 37° C. Similar enrichments were repeated 7 times over a period of 4 months. Tests for the presence of phage were conducted as previously described.

When phage activity was noted on primary isolation, a wire loop was touched to the surface of the lysed area or plaque (Figure 1) and inoculated in 1–2 ml. of HIB as a stock culture. The fluid in the inoculating loop was then shaken out, the material remaining on the wire inoculated into a tube of semisolid agar seeded with the sensitive organism and an agar-layered plate prepared. After incubation, discrete plaques were usually observed. From 3 to 5 such transfers were made. From the last purification, a single phage plaque was suspended in a small quantity of HIB. Three to 5 drops of this phage suspension were spread over the surface of a seeded plate. After 24–48 hours of incubation, the semisolid layer was scraped from the surface with a glass spatula, emulsified thoroughly in 5 ml. of broth, centifuged for 20 minutes at 3,000 r.p.m., and the supernatant used to inoculate 12 agar-layered plates. The semisolid layers were harvested in 30 ml. of HIB, thoroughly triturated, centrifuged, and filtered through a Selas No. 03 ceramic filter. The Selas filter was found to allow rapid filtration of large quantities of broth. The filtrates were stored in the refrigerator at 4° C.

Method of Titration—A modification of Asheshov and Heagy's [13] loop method for titrating phage was employed. A loopful of stock phage, delivered with a platinum-iridium wire loop calibrated to deliver a definite amount, was serially diluted through 3 or more vials containing a measured amount of HIB. A loopful of each dilution was inoculated into semisolid agar seeded with the appropriate organism and layered as described above. After incubation, counts were made on the plate with the highest dilution of phage showing discrete isolated plaques. Titers of at least 10^7 phage particles per ml. were obtained.

Testing Organisms for Susceptibility to Phage—Five ml. of Tween-albumin medium were heavily inoculated from solid stock cultures and incubated until moderately turbid growth was obtained. From 3 to 10 days were usually required

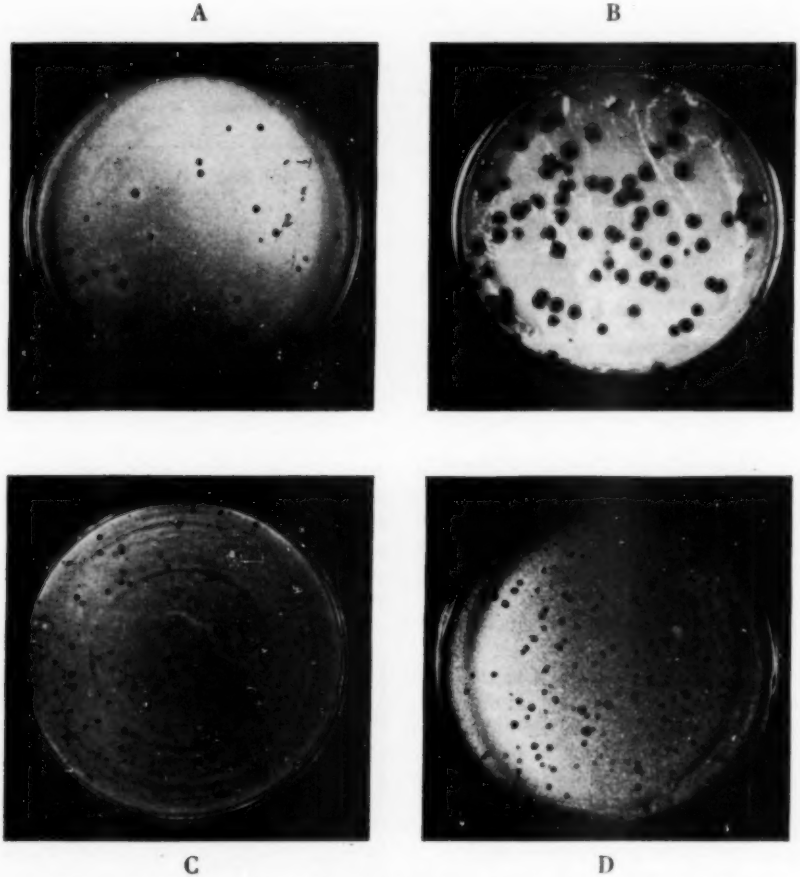


Figure 2—Plaque types of four bacteriophages active on tubercle bacilli.
A—D28 on host strain Mycobacterium lacticola (F 13).
B—D29 on host strain "Mycobacterium tuberculosis" ATCC 607 (F 21).
C—D32 on host strain Mycobacterium species (F 119).
D—D34 on host strain Mycobacterium species (F 130).

for the saprophytes and from 21 to 42 days for the pathogens. Pellicles were dispersed by vigorous shaking and the large particles allowed to settle. The turbid supernatants were used to prepare seeded agar-layered Petri plates and bottles.

Bacteriophage dilutions of approximately 10^7 particles per ml. were used to determine the susceptibility of the pathogens and saprophytes. The test dilutions were spotted on the surfaces of the seeded plates or bottles with very fine capillary pipettes. After the surfaces had dried, the plates and bottles were incubated. The plates of saprophytic strains were read at 48 hours and daily thereafter until satisfactory growth

Table 1

Phage	Susceptible Strain *	Plaques		
		Size (mm.)	Appearance	Border
D28	Mycobacterium lacticola (F13) Smooth, pasty, yellow	0.5–2.0	Sl. hazy	Smooth, regular
D29	"Mycobacterium tuberculosis" ATCC 607 (F21) Smooth, pasty, buff	3.0–5.0	Clear	Hazy
D32	Mycobacterium sp. (F119) Rough, dry, orange	0.5–1.0	Sl. hazy	Hazy, irregular
D34	Mycobacterium sp. (F130) Smooth, pasty, orange	1.0–2.0	Sl. hazy	Hazy, irregular

* Culture on which phage was isolated and propagated

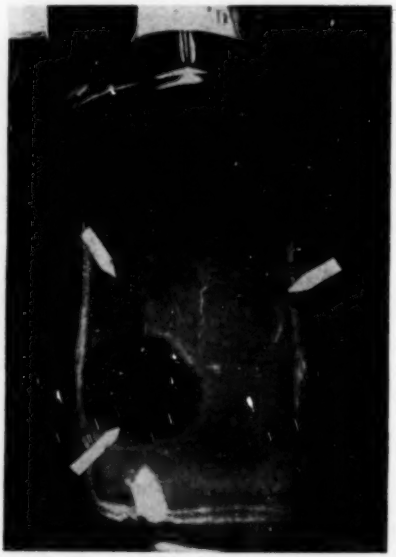
appeared. The pathogens were examined at weekly intervals. Susceptibility was indicated by the appearance of plaques at the sites where the phage had been spotted.

Results

When a large number of saprophytic and pathogenic cultures of mycobacteria were tested with a total of 26 phages isolated in this laboratory, or from other sources, it was observed that phages D28, D29, D32, and D34 produced plaques with a number of pathogens and saprophytes (Figure 2).

D28 and D29 were isolated in our laboratory from soils enriched with mixtures of phage-sensitive and phage-resistant saprophytic organisms. D32 and D34 were among a number of bacteriophages isolated from soils enriched only with saprophytic organisms which had previously been found to be resistant to the phages then available. Though other soil suspensions were enriched with mixtures of virulent tubercle bacilli, bacteriophages active against M. tuberculosis were isolated from soils enriched only with saprophytic culture mixtures. Table 1 characterizes these bacteriophages.

Each of these 4 bacteriophages, when tested against a large number of saprophytes, was shown to have a different pattern of activity. Qualitative and quantitative variations in lytic activity



H37Rv (F71)

Figure 3—Original appearance of phage lysis of virulent tubercle bacilli. Arrows point to plaques.

Table 2—Patterns of Susceptibility to Mycobacteriophages Active against Tubercle Bacilli

Phages					Tubercle bacilli					Saprophytic Myco-bacteria	Total
D No.	28	29	32	34	Human Fresh	Human Stock	Bovine	BCG	Avian		
	+	+	+	+	0	3	3	0	0	40	46
	−	+	+	+	45	5	2	1	0	11	64
	−	+	+	−	113	10	5	2	0	13	143
	Other Patterns				2	1	0	0	0	51	54
	−	−	−	−	13	8	2	2	14	96	135
	Total				173	27	12	5	14	211	442

have been observed with changes in bacteriophage titers and cultural conditions and dictate a need for the standardization of testing procedures. Repeated tests with the same phage preparation on different cultures of the same strain were generally consistent as to the lytic pattern observed. Morphologically similar strains tended to show the same susceptibility patterns, but there were exceptions—some morphologically similar strains had dissimilar phage patterns and vice versa.

Bacteriophage activity against tubercle bacilli was first observed on a series of stock cultures (Figure 3). Lytic activity on tubercle bacilli was verified by a series of 3–5 transfers from single plaques produced on H37Rv (F71) and the bovine tubercle bacillus—Corper (F78), and it was confirmed by tests on a dozen other strains.

Two hundred and thirty-one strains of tubercle bacilli, including 173 strains recently isolated from patients at Olive View Sanatorium, were then examined with the 4 stock bacteriophages. The results, summarized in Table 2, show 192 strains of tubercle bacilli to be sensitive to phage and 39 strains to be resistant. The sensitive strains were placed into 4 groups on the basis of susceptibility. Illustrations of patterns of susceptibility are shown in Figure 4.

Discussion

Many varieties of tubercle bacilli and other acid-fast organisms may be differentiated on the basis of source, pathogenicity, cultural characteristics, and physiologic properties; however, other strains of tubercle bacilli cannot now be so characterized. Although preliminary observations indicate that susceptibility to bacteriophage may aid in distinguishing among strains of tubercle bacilli, bacteriophage typing may achieve greater importance as a means of differentiating and identifying acid-fast bacilli when more specific bacteriophages are obtained. Thus, mycobacteriophages now available are not specific for virulent tubercle bacilli. The same phages may be active against strains of virulent and avirulent human and bovine tubercle bacilli, as well as against a wide variety of saprophytic acid-fast bacilli, with avian strains alone completely resistant to phage lysis.

Summary

The discovery of bacteriophages active against M. tuberculosis of both human and bovine varieties is reported. Four such phages have been found among a series of 26 phages active against saprophytic acid-fast bacilli.

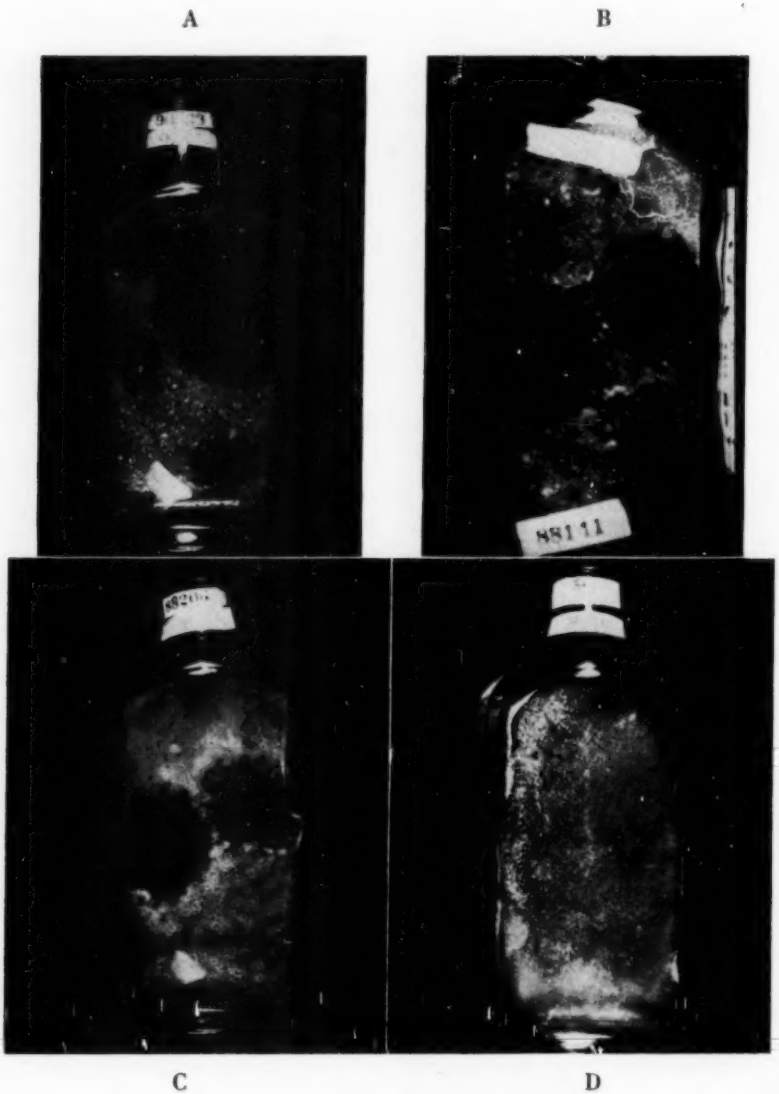


Figure 4—Patterns of bacteriophage susceptibility.
A—Mycobacterium tuberculosis var. bovis (F85).
B—Mycobacterium tuberculosis var. hominis (F 391).
C—Mycobacterium tuberculosis var. hominis (F 457).
D—Mycobacterium avium (F 60).

These 4 phages were tested against 231 strains of tubercle bacilli, including 173 recently isolated strains. Altogether, 192 strains of mammalian tubercle bacilli were phage-sensitive and 25 were phage-resistant; all 14 avian strains examined were resistant.

ACKNOWLEDMENT—The authors express their sincere thanks to the many workers who kindly provided cultures and bacteriophages for these investigations. Assistance in these studies was given by A. M. Blisse.

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Lasker International Awards in Rehabilitation

The first triennial Lasker Awards for outstanding achievement in the rehabilitation of the physically handicapped were presented on September 15 at the Hague, the Netherlands, during the 6th World Congress of the International Society for the Welfare of Cripples. The awards consist of $1,000 and a silver statuette of the Winged Victory of Samothrace. Those who received awards are: Henry H. Kessler, M.D., director, Kessler Institute of Rehabilitation, West Orange, N. J., for "distinguished leadership in the growth throughout the world of concern for the disabled and of effective programs for their rehabilitation"; Dr. Juan Farill, chief surgeon, Shriner's Hospital, Mexico City; William Richard Morris, Viscount Nuffield, president of the Central Council of the Care of Cripples in the United Kingdom and founder of funds and facilities for the crippled in the United Kingdom, Australia, New Zealand, and the Union of South Africa.

A Soluble Gelatin Foam Sampler for Air-Borne Microorganisms at Surface Levels

ROLAND B. MITCHELL, Ph.D., F.A.P.H.A.; MAJOR JOHN D. FULTON, USAF (MSC); and LT. COLONEL HAROLD V. ELLINGSON, USAF (MC)

Industrial and environmental hygienists, especially and particularly, will find much of practical interest in this brief but detailed report—others, too, will want to know about the proposal.

The collection of satisfactory samples for microbiologic analyses is one of the major problems encountered in research concerning the microorganisms present in air. Previous studies, Dorris, et al.,[1] Mitchell, et al.,[2], Timmons, et al.,[3] and Anderson, et al.,[4] have emphasized the need for an adequate air sampling device that can be used under relatively adverse conditions at the surface and at different altitudes. These studies indicated that methods employing filters would be more adequate than bubbler or impinger devices. The air filtering characteristics of a matrix of dry fibers, such as cotton or glass wool, are well known. The difficulties inherent in accomplishing proper processing of these insoluble filters are also well known.

An earlier report by Mitchell, et al.,[2] discussed the need for a water soluble filter comparable to a cotton fiber matrix, both in tensile strength and collection efficiency, which could be dissolved away from the collected microorganisms and other particles, allowing them to be suspended and dispersed in water. Aliquots of this suspension could be used in various culture media and the inoculated culture media then placed under the environmental conditions required for the most adequate or complete microbiologic analyses. Additional requirements to be met by this soluble filter are: simplicity in preparation and sterilization, and provision of a collection site with a minimum number of factors detrimental to microorganism survival. A dry, soluble filter having the above characteristics should provide an adequate method for collecting, culturing, isolating, and identifying microorganisms found in air.

A dry, soluble gelatin foam filter with the listed characteristics was developed, evaluated, and used for the collection of microorganisms from air by Mitchell, et al.,[2] and Timmons, et al.[3] Recent studies of bacterial contamination of extramural air during cold weather indicates the need for a sampling device which can be used on the ground under conditions which prohibit the use of many of the commonly employed collection devices which are excellent laboratory tools, but are often inadequate under conditions found in the field.

This paper concerns a description and comparative evaluation of a gelatin foam sampling device with several other devices commonly employed for microbiologic air sampling.

Methods and Materials

Gelatin Foam Filter—A soluble gelatin foam stock material similar to that developed and described by Mitchell, et al.,[2] is now available from a commercial source.* The dry gelatin foam

* Gelfoam Bricks, nonsterile. Upjohn Company, Kalamazoo, Mich.

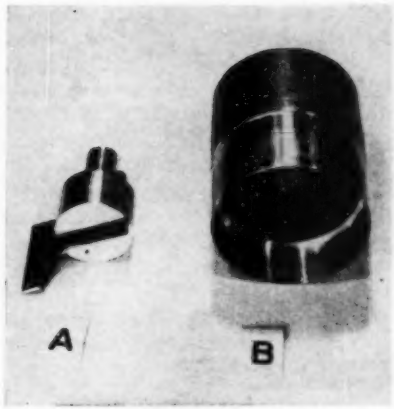

Figure 1—Filter shaping jigs

filter is shaped from the gelatin bricks by means of a jig which holds a knife blade designed to conform to the desired filter shape (Figure 1, A). The jig is held and operated in a rotating drill press. When the top portion of the filter is shaped, the uncut portion (rim) of the filter is severed from the brick with a circular knife (biscuit cutter) 55 mm. in diameter (Figure 1, B). The filter (Figure 2, A) is held in a 4 x 6⅜ inch manila envelope which has a 40 mm. perforation in its center (Figure 2, B). The crown of the filter protrudes through the perforation and the filter is held in place within the envelope by the brim (Figure 2, C). To maintain

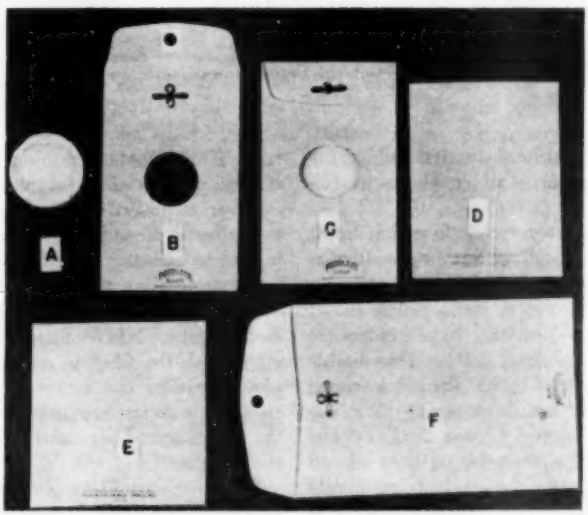

Figure 2—Filter packaging assembly

bricks may be obtained in various sizes. The filters used in the sampling device have the approximate shape of a "derby" hat, with a rim 5 mm. deep and a crown 13 mm. deep, giving an over-all height of 18 mm. The diameter of the filter across the base is 55 mm. The

Dr. Mitchell and Major Fulton are associated with the Department of Microbiology, USAF School of Aviation Medicine, Randolph Air Force Base, Randolph Field, Tex. Lt. Colonel Ellingson, formerly with the Department of Preventive Medicine at the USAF School of Aviation Medicine, is now at Headquarters, Alaskan Air Command, Office of the Surgeon General.

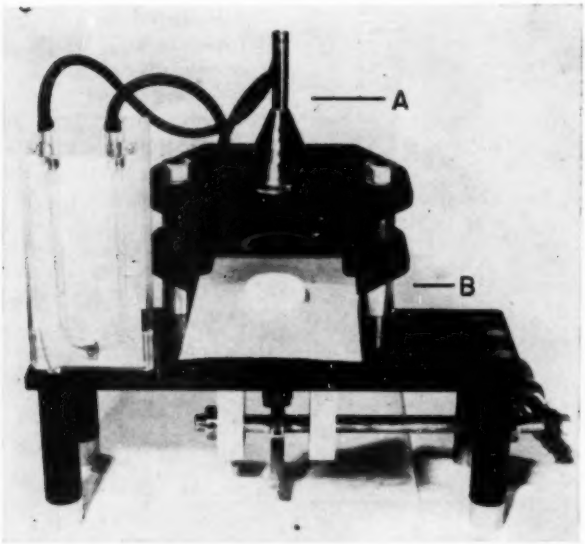

Figure 3—Gelatin foam ground sampler

sterility, the filter, in its holder, is packed in a series of envelopes as follows:

The perforated envelope which holds the filter is placed within an open-throat manila envelope 4½ x 5¾ in. (to construct this envelope, the top 4⅝ in. of a standard 4½ x 10⅜ in. envelope are removed; see Figure 2 D). This double envelope assembly is then telescoped into a larger manila envelope (5 x 7½ in. envelope; see Figure 2, E). The triple envelope assembly is then placed into a clasp type 5½ x 8¼ in. manila envelope (Figure 2, F). The packaged filter assembly is sterilized by exposure to "Carboxide" * gas for 72 hours, using a modification of the technic developed by Fulton and Mitchell.[5] Filter pads, prepared and sterilized according to these descriptions, have retained their collection capacity and have been kept free from contamination throughout storage periods of several weeks.

Prior to inserting the filter into the sampling device, the envelopes are removed in succession and the perforated envelope holding the filter is inserted in the guides provided on the sampling instrument. When filter exposure is completed, the filter is removed and replaced within the series of envelopes. Aseptic technics are used in handling the sterilized filter and its covering envelopes.

Gelatin Foam Filter Sampling Device —The gelatin foam filter holding device for collection of air-borne microorganisms at surface levels is shown in Figure 3. It consists primarily of a sampling orifice (A) equipped with a manometric flowmeter, and the filter holder and sealing device (B) for the collection manifold with a downstream outlet which is connected to an adequate negative pressure source.

The sampling (intake) orifice and

* Ten per cent ethylene oxide and 90 per cent carbon dioxide. Carbide and Carbon Chemical Corporation.

flowmeter were constructed and calibrated according to the specifications given by Lemon.[6] The remainder of the device was designed and constructed by the USAF School of Aviation Medicine Machine shop. The filter manifold consists of two portions: the immovable upper part is equipped with the intake orifice which is connected to the flowmeter; the lower movable platform contains the gelatin foam filter holder and the exhaust outlet. The gelatin foam filter is held in place and supported by a fine mesh screen over an opening in the movable platform. This portion of the device is raised into place by means of a lever and the shaped gelatin foam filter is pressed into the upper immovable portion of the manifold. The edge of the filter pad and its envelope are pressure sealed between gaskets to eliminate leakage. Sufficient negative pressure is applied to the system on the downstream side to draw air into the orifice and through the filter. When the air sampling is completed, the gelatin foam filter is removed, placed in a sterile envelope, and brought to the laboratory. The gelatin foam filter is completely dissolved in sterile water and aliquots of the suspension are pipetted into sterile Petri plates to which the appropriate agar media are added. Following suitable periods of incubation, the colonies present on each inoculated agar plate are counted under a stereoscopic microscope.

In this study the efficiency of the gelatin foam device for collecting microorganisms from ground level air was compared with that of the molecular membrane filter,[7] the Folin bubbler,[8] the M-S-A midget impinger, and the capillary impinger.[9]

Contaminated Air Source—Measured volumes of contaminated air from a single source were drawn simultaneously through each of the various devices employed in the comparative study. The microorganism counts were determined for the volume of contaminated air sampled with each device. From these data the microorganism counts for each device in the comparative study were calculated and tabulated as the number of microorganisms present in a 1,000 liter volume of contaminated air.

Discussion

Comparisons were made of the gelatin foam filter with the molecular membrane filter and three liquid bubbler or impinger collection devices. The results of this comparison are presented in Table 1.

Results obtained from 17 comparisons of simultaneous sampling with the gelatin foam filter (GF), molecular filter (MF), and the Folin bubbler (LI) devices are shown in Table 2.

Tables 1 and 2 reveal that under the conditions of the experimental comparisons, the GF filter demonstrated superiority over the other devices employed. An evaluation study of the GF and MF filters shows that the GF collected more microorganisms from similar volumes of air than the MF device in 73 out of the 74 comparisons. In only two comparisons out of 42 did the LI device collect samples with higher microorganism counts than those obtained with the GF. When compared with the GF filter, none of the other devices—M-S-A midget impinger (DI), or the capillary impinger (CI)—collected samples which gave higher microorganism counts than the GF.

Because they are not subject to freezing, the GF and MF filters are obviously better for the collection of airborne microorganisms during extremely cold weather than are the devices which have a collecting substrata of liquid or agar. Under temperature conditions which would permit the use of water containing collection substrata, the GF and LI devices appear to be more

Table 1—Comparisons of Five Air Sampling Devices

Number of Comparisons	Devices with Highest Comparative Counts					Average Microorganism Counts per 1,000 Liters of Air				
	GF	MF	LI	DI	CI	GF	MF	LI	DI	CI
74	73	1	..	..	..	2,690	660	..	..	..
42	40	..	2	..	..	2,000	..	760	..	..
18	18	..	..	0	..	3,690	..	..	690	..
8	8	..	..	..	0	1,950	..	..	..	280
33	..	11	22	..	..	..	620	1,140	..	..
22	..	16	..	6	..	..	840	..	820	..
63	..	..	43	20	..	..	..	1,070	910	..
41	..	..	28	..	13	..	..	780	..	710
39	..	..	..	28	11	..	..	..	990	730

GF—Gelatin foam
MF—Molecular filter
LI—Folin bubbler
DI—M-S-A midget impinger
CI—Capillary impinger

efficient than the MF. In both situations, the GF appears superior to either the MF or LI device. Further comparison of the MF and LI devices indicated that, under the experimental conditions employed, the LI collected more viable microorganisms than the MF.

Certain of the devices described above have serious shortcomings which limit their usefulness in field studies. Any device employing a nutrient, either liquid or solid, is limited in field use. It is difficult to maintain broth and agar media free from contamination during the excessive agitation which is associated with transportation. In addition to this factor, the exposed nutrient collection media (liquid or solid) must be preserved and growth must be inhibited in some fashion until return to the laboratory where proper analytic procedures can be instituted. When subjected to sufficiently low temperature during the collection procedure, liquid and agar media become frozen and are unsatisfactory as collecting substrata.

Microorganisms collected by filters are subjected to the killing effects of air flow (both mechanical impact and drying) and possibly other detrimental factors. Many microorganisms are entrapped within the insoluble filters and cannot be removed for microbiologic

Table 2—Comparisons of the Gelatin Foam (GF), Molecular Filter (MF), and the Folin Bubbler (LI) Sampling Devices

Relative Order of Microorganism Counts Obtained in 17 Comparisons	Sampling Devices			Average Microorganism Count per 1,000 Liters of Air		
	GF	MF	LI	GF	MF	LI
First	16	0	1			
Second	1	2	14	3,690	930	1,480
Third	0	15	2			

analyses. A solid filter, such as the molecular membrane, collects many of the microorganisms as aggregates, either alone or impinged on dust particles. Usually only one colony will result from a microorganism aggregate of this type. Quantitative and qualitative analyses of the microorganism content of a sample then become extremely difficult. Separation of aggregates, or dust passenger microorganisms, has been attempted and in many cases successfully attained with atomizing and bubbler devices which employ liquids as collection substrata. Unfortunately, this type of device cannot be used under many field conditions, such as freezing temperatures. Other devices that collect microorganisms by impingement onto the surfaces of agar culture media are also rendered inadequate under conditions of freezing. The GF device can collect microorganisms on a water soluble filter which can then be dissolved away from the collected particles. The microorganism aggregates are then dispersed by agitation throughout the diluent.

Under the conditions employed, the collection efficiency of the GF device for collecting viable air-borne microorganisms at surface levels was considerably better than the other devices commonly used. On the basis of the present data and that obtained in earlier studies, there is reason to believe that the gelatin foam filter device can be used for sampling the microorganism content of air at ground level during meteorologic conditions which generally reduce to a state of limited usefulness many of the presently employed devices.

Summary

A device employing a dry, soluble gelatin foam filter has been developed, evaluated, and used for the collection of microorganisms present in environmental air. Comparative studies have been made of this device with the molecular membrane filter and three liquid impinger devices. The gelatin foam filter device was more effective than other devices in collecting viable air-borne microorganisms. Studies have indicated that the gelatin foam filter device can be used for sampling the microorganism content of air during meteorologic conditions which often reduce the effectiveness of conventional sampling devices.

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Comprehensive Medicine in Relation to Public Health

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Comprehensive public health—to fit the burgeoning medical concept similarly designated—implies that the health administrator will be something of a sociologist in addition to his competencies in the now classic areas of public health service.

The concept of comprehensive medicine begins with the viewpoint that all things in life interact, that disease does not occur in isolation and cannot be understood when removed from the context of the situation in which it occurs. The view that the social, economic, and environmental factors in life are important in health and disease is not a new one, but in recent years this view has been neglected or even forgotten by many practitioners of medicine. The problem of duodenal ulcer is an example. It used to be the practice that for a patient with ulcer symptoms the history ended with the elicitation of epigastric pain relieved by food, and the investigation ended with an x-ray of the stomach, or perhaps a gastric analysis. The patient was then treated with frequent feedings, gradually returning to his normal diet with certain medications. At the end of this period of treatment the pain and the ulcer crater were no longer present. However, within a few weeks or months symptoms and ulcer recurred, requiring further treatment, and this continued until the doctor lost patience, called it an intractable ulcer, and advised surgery. Even after surgery, recurrence might occur at the margin of the anastomosis.

In the newer formulation the physician is no longer so concerned with the pain and the ulcer crater. He looks upon these as events in a cycle of persistent gastric hyperfunction and he knows the most potent stimulus for inducing gastric hyperfunction is a psychic one. He therefore looks for the emotional reactions which are pertinent to gastric hyperfunction and for the life situations which arouse these responses. His history, therefore, includes a great deal of emotional and social data. In his treatment he uses frequent feedings and medication for the relief of pain and for the promotion of healing of the crater, but he also spends a great deal of time educating the patient concerning emotions and situations which he knows to be pertinent to gastric hyperfunction. In this way he hopes to prevent recurrences, as well as to relieve the existing symptoms. Such an approach in the physician requires, first, a dissatisfaction with medicaments that are purely symptomatic and which neither cure nor prevent. It calls for a desire to know anything pertinent to the disease, whether it appears at first sight to be of medical importance or not, and a desire to apply this knowledge and to make the patient understand.

Thus, when treating patients with duodenal ulcer, the physician who wishes to practice comprehensive medicine takes upon himself the responsibility of seeing that the patient becomes interested in those attitudes and life adjustments which are pertinent to gastric hyperfunction. Patients with duodenal ulcer are frequently ambitious and may have a great need for at least an appearance of independence. To them, emotions are weaknesses and the suggestion that their illness may be related to emotions sometimes arouses strong resistances. The physician,

therefore, must begin with simple facts, well known to everyone and not necessarily pertinent to duodenal ulcer specifically, but used rather to establish the importance of emotions in relation to physiologic changes, such as blushing with embarrassment. Until this relationship is acceptable to the patient, he does not undertake the second step which is approaching the specific problem at hand. In piecing the picture together the physician becomes involved not only in the treatment of the symptoms, but also in the mental, emotional, situational, and social aspects of the patient's life and in his occupational and economic welfare. The physician may enlist the aid of relatives or suggest some situational change. For example, he may suggest a change in occupation if it becomes evident that the pertinent life situation in this man's problem is difficulty in accepting close direction from a critical boss. However, the physician knows that there is more than one solution to the problem: without a change in attitude, a change in occupation may be necessary; likewise, no change in occupation may be necessary if a change in attitude occurs. He presents the facts; he offers help; but the decision rests with the patient. The doctor does not sit quietly by while the patient is making his decision. He does all in his power to help the patient make a decision based on facts and unimpeded by emotional prejudices so that it will bring lasting satisfaction.

Such an approach to medical care increases the physician's responsibilities to his patient and calls for a knowledge of community resources available to help his patient realize his greatest potential. This knowledge offers great returns in broadening the physician's view of disease, increasing his understanding of human nature, and enriching his whole outlook on life—it pays dividends as well in respect and loyalty from the patient.

The situation in public health is not too dissimilar. In this case, the public health officer is the physician and the community is the patient—and, I might add, the community includes the physicians within it. A comprehensive outlook in public health also requires a health officer who is dissatisfied with a limited viewpoint, who is eager to learn the interrelationships which exist, and who has an earnest desire to get the community to understand these relationships. In many instances the community is no more interested in seeing the true nature of the problem than the patient with ulcer is in seeing that emotional attitudes are in some way related to his illness. The health officer if he is to be effective must approach the community with these resistances in mind so that he will not go too directly to a point that will be resisted. He must start at some point on which everybody is likely to agree, as does the physician who uses blushing as an example of a physiologic change correlated with an emotional reaction. The first requisite, of course, is research—the acquisition of facts. Following the acquisition of facts there is a long and difficult problem of education of the physicians in the community as well as the public at large.

To illustrate the complex interrelationships which exist, take the problem of chronic illness in the aged. The general aging of the population is too well known to need repetition. What many people miss, however, is that not only the extent but the very nature of the problem is changing. To start with a very simple fact of which everyone is

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aware, there is a trend in our culture toward smaller family units and more individual homes. "A home for every family" is one of our goals. However, the definition of "family" has undergone change. It now means the father, mother, and their immediate children. The family no longer includes all of the aunts, uncles, cousins, and in-laws. Homes are no longer built to house 15 or 20 people. They are now small dwellings for small families. This represents a tremendous cultural change.

By decreasing the number of people in the home there is an increase in the intensity of emotional reactions, since there are fewer people to absorb frictions. There is an increase in the economic burden on the wage earner of the family, since there are fewer people contributing. There is an increase in the duties and responsibilities of the mother, for certain of the household duties must be done whether one person is doing them or three or four. Although the intensity of emotional ties within the small unit are increased, the ties of the larger unit are weakened, and thus population mobility is increased. The burden on the family is greatly increased whenever one of its members becomes ill, for there are fewer people to take on the burden of nursing and fewer to take over the responsibilities previously shouldered by the ill member. Available home resources for nursing chronically ill members of the family are therefore decreased and the percentage of people who require hospitalization, nursing home care, or institutional care is increased.

Another factor is our cultural attitude toward the aged. There is less respect for age; the aged have fewer functions. We look to the future as our goal and are less concerned with the past. Consequently, there is less feeling of responsibility for the aged when they become ill. Our cultural definition of family as father, mother, and immediate children has no place in it for grandparents, or elderly aunts or uncles. The ideal of a home for every family, with the family thus defined, actually excludes these older people. They become intruders on the scene, if they suddenly must return to their children's home, and this adds to the burden that the children feel is being thrust upon them. The elderly person who becomes ill and is unable to care for himself has the same need for affection which he had formerly, but this need often goes unsatisfied. Because of his authoritarian upbringing he expects respect as his due. He does not get it, and this disturbs him. It was formerly one of the functions of the older person to pass on the ideals, value systems, and goals to younger generations. These old standards are no longer respected with the breaking of the larger family ties and our orientation to the future. Therefore, this function is denied him. He has few occupational opportunities open to him, so that productive activity is curtailed. He has been brought up with an ideal of independence; consequently, dependence is difficult for him to accept. He has matured with the idea that in his leisure time in declining years he would be able to exploit his full potentialities; yet all his life he has devoted himself fully to the social goals of our day which are economic success, prestige, productivity, and efficiency. In old age the occupations or avocations open to him do not bring success or prestige, nor is he able to bring efficiency to them. The values by which he previously judged himself are no longer pertinent. This requires a major adjustment in his thinking. If he tries to live with a son, he is acutely aware of the economic burden which he is placing upon this son—particularly so in our present social setup where but a single person is the wage earner for the family. Social security and public assistance programs are available, but if the individual has

valued his independence highly, this is difficult to accept. It requires additional emotional readjustments. This is one side of the problem.

From a different point, we find at present a trend for physicians to see patients only in their offices and only during their office hours. They make fewer home calls and fewer night calls. This has many benefits for the physician. It makes his work day much more efficient because time is not lost in travel, diagnostic aids are at hand when he wants them, and nursing aid is present. To the practicing physician, staying in one spot and having all his patients come to him seems infinitely desirable. To be sure, it lessens his personal contact with the patient and it decreases his awareness of the family, social, and economic problems of his patient. But since he is not aware of these problems, he is not aware of the importance which they have to his patient or to himself. Nor is he aware, in any personal way, of the deep dissatisfactions which are sometimes engendered in the patient by this system.

For the patient, this trend in medical practice decreases the availability of medical care and increases his apprehension in case any medical emergency should arise. It also increases the apprehension of the family caring for an aged member who may have some sudden, apparently catastrophic episode such as a stroke, a heart attack, or falling and breaking a hip. The aged should be seen frequently, even though many of their visits will be unnecessary from a strictly medical viewpoint; yet they are often unable to make frequent trips to the physician. Thus a new type of care becomes necessary for these people. Since the doctor cannot make frequent trips to a person who does not need his professional attention, someone else must take over this function. Consequently, any public health program for the care of the chronically ill and aged must, at the present time, have an extensive nursing care program as a prominent part of it.

Of what value are such facts and relationships to the public health officer? They can be extremely useful to him in educating both the physicians of the community and the public at large. In considering the problem of caring for the aged, particularly when ill, it does not matter whether we start from the simple fact that families are now smaller and that there are more of them, or from the fact that physicians are spending more time in their offices and less in the homes of their patients. In either case, we come to the conclusion that some new source of nursing care is necessary for these patients, both because there are not people in the home to take on this responsibility and because physicians cannot take the time to do it. An understanding of these relationships is also of help in allaying some of the bitterness that arises within families over the problem of caring for aged relatives. An explanation of some of the factors that have created the situation can help both sides toward understanding and acceptance of whatever decision is finally reached. An appreciation of some of the emotional adjustments that the elderly person must make can also be used to great advantage to this same end, and the shift to public assistance or nursing home or institutional care can also be made easier. There is much more to the problem than this, however.

The problem of promotion of health is a major one in the older age group. Having passed their economically productive years they feel that they are useless, that they are not respected, and that they are not wanted. As a consequence they begin to neglect themselves. General hygienic measures are not observed. Nutrition is apt to be inadequate, both because of defective teeth and because of loss of appetite associated with feelings of depression. Many

of the diseases of older age are related to three things: nutritional deficiencies, circulatory disturbances, and general disuse. All of these are matters in which simple health education can be most helpful. Employment, within the limits of capacity, is also important in preventing feelings of uselessness. Economic insecurity carries with it tremendous emotional impact and anything which can be done to maintain these people at some type of employment is useful. Rehabilitation in the partially disabled is another important aspect of this problem. Toward this goal, the health officer must be aware of all of the community resources for rehabilitation. Recreational outlets are necessary for the aged and should be promoted in the communities which do not have them. When nursing care can be found in the patient's home, everything should be done to make the home atmosphere as pleasant as possible. Care should be exercised to eliminate accident hazards. Where the home is not available, nursing homes, institutional care, and hospitals may be needed. The health officer takes a deep interest in the adequacy of these facilities, not only from the physical standpoint, but from the mental and social standpoint as well.

Nor is this yet the end. In addition, a health officer must keep himself advised of developments and trends in treatment of these chronic ailments. He cannot give the people in his community adequate advice without this knowledge. He cannot know what the outlook is, how long treatment will last, how long nursing care will be necessary, how much rehabilitation can be anticipated, nor what the final total adjustment of the individual may be without knowledge of such advances. He must, in addition, keep up with developments in the studies of etiology of chronic disease and of research going on in the general field of aging processes. Without this knowledge he cannot know where preventive measures will be useful. He should also keep abreast of the development of screening technics for the degenerative diseases. What the future of these procedures will be remains to be seen, but the health officer must be well apprised of them.

As a single illustration, chronic disease in the aged has been used to express the concept of comprehensive public health and to show the many facets of this problem and how these facets relate to the work of the health officer. Such a viewpoint requires a health officer who is not only aware of the problems as they exist, but who is intensely interested in their solution, who has a wide knowledge, not only of sanitation and communicable disease control, but of social and cultural trends in society, of economic developments, of occupational pursuits in his community, of community ideals and attitudes, of racial and geographic problems, of community resources for health, of public assistance programs, of developments in the etiology and treatment of disease, and of the interrelationships which all of these things have. Then, having acquired this knowledge, he must, above all else, have an abiding desire to communicate the information to others. This is health education. It requires not only presenting the facts to the patient, in this case the community, but arousing the community to an interest in these facts—even as the physician who has a patient with duodenal ulcer must arouse his patient to an interest in the emotional aspects of his illness. The decision rests with the community, but the health officer does not stand by passively waiting for the community to make this decision. It is his responsibility to arouse interest in the problem and a desire for correction, to present all pertinent facts so that a lasting and satisfying decision will be made. All of this is directed toward helping the community function at its highest potentiality.

A Proposed Plan for Community-Wide Mental Health

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It would seem that mental health will play its most productive part in public health administration when psychiatric workers themselves visualize the preventive possibilities in the services they have to contribute. This is an example of that vision.

Any plan that purports to affect the community's mental health must take cognizance of culture and the role it plays in mental illness. We believe a successful plan must be broad enough in scope to involve the community intimately in treating its own illness, though we find that most community clinics have confined their efforts largely to the treatment of the individually sick person, the greater needs of the community often being ignored. Professionally trained personnel must begin to expand their functioning beyond the four walls of the clinic and come to grips with the problem where it exists —in the community. This is a responsibility mental hygiene workers have tended to avoid, but if the community's potentiality for growth is to be enhanced, this responsibility cannot be ignored.

In this paper we should like to share our reasoning regarding what should be included in a total community mental health program, the reasoning being based on our experiences in teaching, community mental health clinics, public health mental hygiene programs, and the private practice of psychiatry.

Proposed Plan

Purpose—This plan is offered as an instrument through which society can make an intelligent and concerted effort to change cultural patterns, enhancing greater maturity and a sense of well-being in individual, family, and community life. It provides for the early discovery and correction of remedial defects. It also attempts to create appropriate patterns of thought, feelings, and action, educating the public in the principles of healthful living. Its aim is to develop a sense of responsibility for community mental health.

Functions—To be called the Community Guidance Center: this center will offer (1) diagnostic and treatment services to emotionally disturbed children and adults on an outpatient basis; and (2) educational and preventive services.

The dissemination of mental health information will be conducted through all available media, e.g., pamphlets, books, newspapers, radio, television, talks, panel discussions, etc. This is a method of bringing about an intellectual understanding of emotional problems. The other phase of the program is an experimental one, attempting to prevent emotional disorders via the medium of group work in human relations. Primarily, it is aimed at reaching those groups in the community who are in the best position to induce cultural changes making for healthier living. These groups should include the executive, legislative, and judicial bodies of the community as well as the clergy, the educational system, physicians, lawyers,

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the Department of Public Welfare, the Department of Recreation, Family Service, and other key agencies and institutions.

The staff will work with individuals, agencies, and organizations in such a way as to enlist their efforts in combating mental health problems as they exist in their own areas of functioning and in the total community. The center will give support to the community's effort to create parks, recreation facilities, etc., which provide socially acceptable outlets for aggressive and creative energies.

Research—The center will attempt to develop research projects in both clinical and community phases of its work. In doing so, it may evaluate its programs and also contribute to the scientific body of knowledge in psychiatry and ancillary professions. The center's staff will train incoming professional personnel in all phases of mental health work. The center can also offer teaching and training experiences to other professional personnel. The staff would provide consultation services to other agencies regarding mental health programs. Supervision would be offered to professional and lay personnel who are performing services which contribute to the mental well-being of others.

Programs

(Priority I) Treatment—Emotionally disturbed children and adults may be referred to the center for treatment. As with other communicable diseases, the person who is emotionally disturbed is not only sick in himself but also is an agent of emotional contagion within the community. In this sense, then, when a sick person is treated, the disease is prevented from spreading. Priority shall be given to those cases where prognosis is most favorable and where the length of treatment is predictably short. It is desirable to be oriented toward short-term intensive psychotherapy, the aim being to treat as many cases successfully per year as is feasible. Such a policy should limit the spread of emotional disorders more effectively than if chronic cases requiring long-term treatment were to be accepted.

(Priority II) Education and Prevention—There is an appalling lack of understanding and an abundance of misinformation regarding emotional disorders. The educational and preventive program will utilize both didactic and experiential approaches in attempting to correct this condition. Dissemination of information is important. It alone, however, is not enough. Intellectual insight does not necessarily produce emotional changes making for healthier living. Recognizing this, we have explored other vistas. The following represents our planning as of this date.

The experiential program is an attempt to provide an effective vaccine which will produce active immunization against emotional disorders. Group work in human relations has been conducted so as to stimulate the experiencing of those emotions which are recognized as contributing to unhealthy patterns of living and personality disorganization under stress conditions. Group work itself is a controlled stress experience, for anxiety is increased. Just as most vaccines elevate body temperature, these group meetings usually raise the level of anxiety of the participants. It is through the experiencing of strong feelings and the concomitant increase of anxiety in the group that the members come to derive a better understanding of "self" and others. We believe the resultant increased capacity to invest affect in everyday interpersonal relationships will afford some immunity to emotional disorders as well as prepare the individual to offer more understanding and emotional support to others.

Priority will be given to groups

occupying positions of leadership in the community. This program attempts to help people in key positions achieve their maximum social therapeutic potential.[1] These people are usually in a more advantageous position to change culturally determined, unhealthy emotional patterns of living. This does not mean to say that every vaccine so administered will "take" the first time. Some may require repeated doses. By the same token, the center shall constantly lend its efforts to the refining of the vaccine and the testing of its value. This is a long-range program. Until a large segment of the community's leaders are so affected, its preventive potential will probably not be realized. Judging the efficacy of this type of program will require research.

The authors want to make it clear that this approach to the preventive aspects of emotional illness has proceeded beyond the planning board stage. It has been tried in two communities. A total of 47 groups (or a total of 677 individuals) have had this experience. They include such groups as teachers, PTA's, public health nurses, public health sanitarians, practical and registered nurses, student nurses, college and university professors, ministers, Family Service, Child Placement Service, American Association of University Women, and Girl Scout leaders. While no specific research has been done in this area, our clinical impressions lead us to believe this program has value and should be explored further.[2, 3]

(Priority III) Consultation and Supervision—Most of the community social agencies desire consultative services. The center's staff will endeavor to help other agencies to become therapeutic agents in their own areas of functioning. They may, upon request, receive consultation and case supervision if they so desire. Psychological diagnostic testing, clinical evaluation, and assistance in therapeutic management shall be part of this service. These groups shall be offered workshops in human relations.

Recently, Community Research Associates, Inc., made a study of health, recreational, and social service agencies in Columbus, Ga.[4] They found approximately 50 per cent of the community's financial effort for these services went to 6 per cent of the population. This 6 per cent received $2,500,000 of the $4,500,000 budgeted for these services. The 6 per cent represented badly disorganized families. The multiproblem families, a phrase coined to indicate the presence in the same family of some combination of the major problems of chronic dependency, ill-health, and disordered behavior, showed a startling incidence of emotional disorders.[5] A previous study by the same research group of multiproblem families in St. Paul, Minn., indicated the presence of 79.4 per cent of the psychiatrically diagnosed emotional disorders, 69.2 per cent of the reported mental deficiency, and 52.9 per cent of the officially reported antisocial behavior in these families.[6] At the present time Columbus has no organized effort to treat this problem. In the past, agencies have treated single symptoms in the individual as an acute problem. No long-term program exists to treat these families suffering from a chronic illness.

A family-centered, community approach to this problem is necessary. Most agencies, however, are organized to treat a single symptom, i.e., give financial aid, handle an acute situational problem, treat ill-health, or an emotional, mental, or behavior disorder in a member of a sick family. This, we believe, reduces not only the anxiety of the patient and robs him of his strengths to help himself, but also promotes chronic dependency. Giving services also reduces the anxiety of the agency and often inadvertently helps induce chronic dependency in the client. Thus,

the current acute symptom is often patched up only to break out again in some other area requiring a different patch. In other words, most agencies seem to be oriented toward ameliorating immediate suffering with no long-range goals for rehabilitation of the family or the community in view. As a result, considerable professional time, effort, and money is wasted. This happens when the basic emotional and social problems of individual and community life are largely ignored.

What is needed sorely is an organized concentrated total community effort to treat this problem. We believe it is possible for all people who have anything to do with such problems to achieve a basic common philosophy which will enable them to work together for the common good even though each may operate in a unique sphere of influence. In fact, we believe this must take place if we are to stem the tide of mental and emotional illnesses.

(Priority IV) School Health Program—This has two phases, treatment and prevention. Emotionally disturbed children and their parents may be referred to the center for treatment. Teachers and nurses have the opportunity to participate in group experiences in human relations in an attempt to get a better understanding of themselves and others. They can help in working with emotionally disturbed and mentally retarded children. The center will lend its efforts to the establishment of sound programs for the exceptional child. Psychological diagnostic testing and clinical evaluation services shall be available to the schools. The center's staff may provide lecture and panel discussions on mental health topics.

(Priority V) Coordination of Services with Local Hospitals—The center and hospitals will coordinate efforts to establish inpatient and outpatient psychiatric services.

(Priority VI) Professional Training —Few psychiatrists, psychologists, psychiatric social workers, and psychiatric nurses have received training in the community aspects of mental health work. The graduate curriculum in these disciplines provide little in the way of community mental hygiene technology and programing. The center will endeavor to become a resource for the professional training of these specialists in the community phase of mental health work.

Staff and Facilities

Personnel — The minimum staff should consist of a full-time psychiatrist-director, a chief clinical psychologist and clinical psychologist, a chief psychiatric social worker and psychiatric social worker, a stenographer-office manager and a stenographer.

Physical Plant—A separate unit, preferably a large comfortable house, readily accessible to the community is needed.

With this kind of concentrated effort, we believe it should be possible to activate the total community to treat, more effectively, its own illnesses.

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Public Health's Interest in Home Accident Prevention

EMIL A. TIBONI, M.P.H., F.A.P.H.A.

In home accident prevention the old saw about looking before leaping is so pertinent that the resurrection of that cliché may be forgiven. Here is how one city health department is going about its preparatory "looking."

Home accident statistics in Philadelphia are essentially similar to those of many other cities. This is another way of saying that they are not satisfactory to the Health Department, an agency which is devoted to prolonging life and preventing needless suffering and disability. We find that, in 1952, accidents were the fourth leading cause of death in the city, accounting for 1,003 fatalities. Approximately half of these, or 495 deaths, were from accidents occurring in the home. Accidents were the leading cause of death from age one to age 24, with home accidents again responsible for a substantial proportion of the total.

Data on the incidence of nonfatal accidents are not available, but there is no reason to believe that their relationship to the fatality rate is markedly different from those of other communities, generally accepted as 150 disabling injuries per home-accident death. This would mean that there were approximately 75,000 disabling home accidents in 1952.

Even such general observations as these indicate an obvious need for the planning and development of research and operational activities to determine and carry out effective measures for the prevention of accidents in the home and the residential neighborhood. An examination of the resources available in the Health Department discloses that existing functions can be readily adapted to conduct the necessary operations.

One task, probably the most basic, is the gathering of data concerning the occurrence and types of home accidents, the characteristics of the environment that cause or predispose to the accidents, and the personal actions or conditions which were fundamental reasons for them. Only with this kind of information can a program of action be formulated and evaluated.

The substsantial importance of the physical environment as a factor in the occurrence of home accidents requires that accident prevention activity be integrated with the broader program of improving housing and neighborhood quality. This integration is as important in research and data collection as it is in the operational aspects of the program. The Housing Hygiene Section of the Philadelphia Department of Public Health was established to study the effect of all aspects of the residential environment on health, whether the effect might be in the form of accidents, communicable disease, mental or emotional maladjustment, or physiological

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impairment. A fundamental operation of the section is expected to be the collection of comprehensive and specific information concerning dwellings and their neighborhood environment. In this process the data will be detailed in whatever respects may be found necessary to permit useful exploration of relationships of housing conditions and health. This information is to be used in formulating pertinent programs of action. Accidents will constitute one of the major areas of exploration.

It is expected that the field personnel of the Housing Hygiene Section will be trained to obtain most of the dwelling and household data normally required for research in home accident prevention. Home visits by nursing personnel of the department may also be used for the collection of certain types of information. Special attention to the accident problem should also be provided by the Office of Statistics and Research of the department, particularly in regard to broadening the scope of routine collection of basic data.

It is not possible for a line agency of a city to remain long in a purely research phase of development, even if it were so inclined. It is expected that accident prevention education, both specific and general, will be conducted through the medium of various health department activities almost from the start. There is literally no program of the department which cannot be employed for educational service. The chief opportunities, however, should lie in the work of health educators, public health nurses, and housing sanitarians. In the case of health education, the aim will be to acquaint the general public with home accident hazards and preventive measures, and to guide and assist the educational efforts of other specialties of the department.

The Nursing Division and the Housing Hygiene Section will have daily opportunities to carry the message on a personal basis to many householders during the course of their visits or inspections in the home. Clinics and educational meetings conducted or assisted by nurses offer unusually favorable opportunities for group education and motivation.

Concurrently with public education, the Housing Hygiene Section will be working to remove potential accident-producing factors from the environment. This will involve multilateral approaches to secure better facilities and design, adequate maintenance, and reasonable space-occupancy relationships. The range of effort should extend from the introduction of safety consciousness into the minds of architectural students as a paramount subject of concern to the amelioration of safety standards in the palliative control of the lowest quality existing housing. Here again, education must be the basic element of approach. Inclusion of safety requirements, as their needs can be demonstrated, may be expected as an important part of the constant reexamination of the various ordinances and codes concerned with housing quality.

The neighborhood factors should not be overlooked in planning home accident prevention. The housing environment is generally regarded by public health workers as including the neighborhood within which the dwelling is located. It is therefore as important to think in terms of heavily traveled streets, lack of safe play or other recreational facilities, poorly maintained sidewalks, unprotected breaks in grade, or other neighborhood factors, as it is to be concerned with the commonly accepted dwelling hazards. Here, again, legislation may be influenced to advantage but exposition of important hazards and close cooperation with city planners, traffic engineers, recreation directors, and other specialists may be equally rewarding.

We have recently observed substantial and dramatic publicity of the deaths of children in abandoned refrigerators, quarry pools, unused wells, and ponds created by uncontrolled excavation. We have not generally learned of the injuries sustained from these and other environmental hazards, such as piles of lumber, waste materials, or junk filled yards which are probably more common in developed urban areas such as Philadelphia.

The emphasis which we have placed on the environmental hazards and deficiencies should not be construed as a preoccupation with them. We are thoroughly and sympathetically aware of the importance of the personal factors also. We recognize, however, that the discovery of correctable personal characteristics still requires substantial study. Education and training in these matters, as opposed to explanation, involves a long process of repetition and conditioning. If we are able to remove some of the environmental factors, which combine with personal factors to produce accidents, we shall at least prevent some suffering and deaths while the people are learning how they should adjust to their environment and conduct themselves safely.

There is also the possibility of concentrating and specializing approaches to meet the greater accident dangers of children and the aged. Consideration should certainly be given to the particular needs of these groups. It may be advisable to concentrate on certain types of accidents which we may find to be particularly significant or with which we may be able to deal most effectively in Philadelphia.

There is to be developed in the Health Department an Industrial Sanitation Section. Part of the program of this section will undoubtedly be concerned with occupational safety. It will certainly be important to have home accident prevention and the occupational safety activity considered together to assure an integrated over-all program.

There are two other environments in which accidents may occur and which are already receiving close attention. They are the environment of recreational locations and the environment while in transit away from home. It is the firm intention of the Health Department to avoid duplication of efforts that are already being conducted satisfactorily by other agencies. Precautions in this regard will be especially necessary as the desire for comprehensive safety coverage extends outward from the home and place of work. Attention in the areas of recreational and transportation environment will be limited to such problems as are not or may not be better met by other agencies, or as they may relate directly to the other accident prevention activities of the Health Department.

These comments have been made with the accident prevention needs of Philadelphians in mind, but they have been purposely general in terms of action to be taken. They are not to be construed as a program plan, but rather as a preliminary indication of some of the desirable objectives of the program which cannot be undertaken until additional investigations of community needs, interests, and resources have been conducted and other groundwork has been laid. When the program is begun, limited personnel and funds will force the selection of the restricted set of activities which promise to be the most useful in the total complex.

As we proceed with our consideration of this outstanding community need, we shall be most anxious to meet and consult with those who are also interested or are already working on it. Frequent and constant exchange of our various experiences is particularly important at this time.

Teaching Public Health to Dental Students

D. M. HADJIMARKOS, D.D.S., M.P.H., F.A.P.H.A.

Until quite recent years public health received little attention in dental schools. Hence, many practicing dentists lack a clear picture of public health objectives and methods and, so, fail to assume leadership in the promotion of public health dentistry.

The importance of teaching public health to dental students has received increased recognition in recent years. However, since dentistry is a relative newcomer in the field of public health, the problems related to the proper balance of such a course in the curriculum of the dental schools, as well as to the contents of this course, have not been solved as yet. As a result of a number of studies it is well known that there exists a great amount of unmet dental needs among the population of the country. Furthermore, the percentage of the population of the country receiving an adequate level of dental care is believed to be small. On the other hand, as a result of extensive research conducted in recent years the dental profession has at its disposal certain methods and technics for combating dental disease successfully.

According to the definition adopted by the American Dental Association, dental public health is considered to include "those organized community health services which cannot be rendered by the private practitioner alone."[1] Obviously, the application of accepted preventive measures on a community basis will help considerably toward the improvement of the oral health of the people of the country. It was with the above thoughts in mind that a survey of the dental schools of the country was undertaken in order to obtain basic information regarding the course in public health as it is taught to undergraduate dental students.

Method and Results

For the purposes of this investigation, an appropriate questionnaire was devised and sent to the deans of the 41 dental schools in the United States that have been accredited by the American Dental Association. Replies were received from 34 schools which represents a satisfactory response for deriving some valuable information on the subject. The questionnaire was divided in two parts. The first applied to the schools which included a separate course in public health in the curriculum; the second was concerned with the schools that did not teach a separate course in public health.

In general, the findings of the survey show that among the 34 schools that replied to the questionnaire, 30 include courses in public health in the curriculum and four schools do not teach a separate course on this subject. In all dental schools the teaching of public health includes lectures on subjects pertaining to both general and dental public health. Of the 30 schools that give courses in public health, 25 combine in one course lectures in general and dental public health topics. In five schools the lectures on topics in general and dental public health are handled as separate courses.

The answers to questions contained in

the first part of the questionnaire revealed the following points of interest:

Among the 30 schools which include public health in the curriculum there is a great diversity regarding the total number of lecture hours devoted to the subject. This variation ranges from a low of eight to a maximum of 51 lecture hours. The following presentation gives a summary of the variations in lecture hours among the 30 schools (figures outside the parenthesis represent number of lecture hours, figures in parenthesis denote number of schools): 8, 10 (1); 11 (3); 16 (6); 18 (2); 20 (2); 21 (1); 22 (2); 24 (3); 26 (2); 30 (1); 32 (3); and 34, 38, 51 (1).

In an effort to determine the amount of time spent in presenting to the students topics in general and dental public health, the deans were asked to give separately the number of lecture hours devoted to each subject. Here again the same wide variations were apparent regarding the number of lecture hours devoted to topics in general public health and dental public health. A summary of the findings on this point is presented below (figures outside the parenthesis represent number of lecture hours, figures in parenthesis denote number of schools).

General public health: 4 (2); 5 (3); 6 (3); 8 (4); 10 (3); and 15, 16, 18, 20, 28, 30, 34 (1).* Dental public health: 2, 4, 5 (1); 6 (3); 8 (3); 10 (3); 11 (1); 12 (2); 14 (3); 16 (3); 17 (1); and 18 (1).

Seven of the schools which give a course in public health did not specify the number of lecture hours devoted separately to general and dental public health subjects. Among six schools more lectures were given on topics pertaining to general public health than to dental public health.

In the case of the 25 schools where the lectures in general and dental public health subjects are combined in the same course, the educational background of the persons in charge of the course is as follows: 20 are dentists, four are physicians, and one lists a Ph.D. degree. Of the 20 dentists who are in charge of the course, 12 also possess degrees in public health (M.P.H.) and three list other graduate degrees (M.A., M.S., Ph.D.). Of the physicians who are in charge of the course in four schools, three also list degrees in public health (M.P.H. or Dr.P.H.).

In five schools general and dental public health topics are presented as separate courses; of those in general public health three are in charge of physicians having graduate degrees also in public health and two in charge of dentists. The courses in dental public health are all in charge of dentists, two of whom have graduate degrees in public health and one lists a Ph.D. degree.

The educational background in respect to degrees of the persons who give either all or most of the lectures on subjects pertaining to dental public health is as follows: 28 are dentists, one is a physician having a degree in public health also, and one person lists a Ph.D. degree. Among the 28 dentists, 16 also have degrees in public health and four list other graduate degrees (M.A., M.S., Ph.D.).

In respect to the lectures on subjects pertaining to general public health it was found that in 15 schools these lectures are given jointly by specialists in various fields of public health and the person in charge of the course. In the remaining schools the lectures are given either exclusively by specialists in various fields of public health or only by the person who is in charge of the

* One school did not specify the number of lectures devoted to general public health.

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course. In the great majority of schools the course in public health covering both general and dental public health topics is taught during the senior year. In only a few cases is the subject included in other years of the curriculum.

Among the dental schools which include courses in public health in the curriculum the students in six are required to conduct a dental survey of groups of school children—although not every year in all six schools—as part of their training in dental public health. Through such a procedure the students no doubt acquire some valuable experience in the methodology of planning and executing dental surveys of population groups.

The answers to questions contained in the second part of the questionnaire revealed the following: Of the four schools which at present do not teach a separate course in public health, three replied that they plan to inaugurate such a course in the future. On the other hand, all four schools answered that they include lectures pertaining to topics on dental public health in a variety of courses, such as the following: bacteriology, pedodontics, oral diagnosis, oral pathology, preventive dentistry, preventive medicine, operative dentistry, and practice management.

Comments and Conclusions

From the above presentation of the findings of the survey it can be generally stated that the value of teaching public health to undergraduate dental students has been recognized, although in varying degrees of emphasis, by most of the dental schools of the country. In the majority of the schools lectures on general and dental public health topics are combined in one course.

A survey of similar nature was conducted among the dental schools some years ago by the American Association of Public Health Dentists. As a result of this the following recommendations were made[2]:

> That the American Association of Public Health Dentists promote in every way feasible:
>
> 1. Courses in general public health of at least one semester's duration, taught by competent and qualified M.D.'s or Dr.P.H.'s.
>
> 2. Courses in dental public health of at least one semester's duration following the prerequisite general public health course, taught by competent and qualified D.D.S.'s and preferably one who has had formal training in public health.

Since a course running for one semester includes at least 16 lecture hours, it is apparent from the results of the present survey mentioned above that only six schools devote 16 or more lecture hours to general public health and five schools to dental public health. On the other hand, there are a number of schools in which the academic year is divided into three terms. On this basis, a course given for one term includes at least 10 lecture hours. As it is indicated from the results of this survey shown above, 10 or more lecture hours are devoted to general public health by 10 schools and to dental public health by 14 schools.

Among the 28 dentists who are giving either all or most of the lectures on subjects pertaining to dental public health, 16 also possess graduate degrees in public health, although, undoubtedly, other qualified persons are connected with the course. This is an improvement over the previous survey conducted by the American Association of Public Health Dentists where it was found that nine dentists also having M.P.H. degrees were associated with the courses in dental public health.[2]

The results of the present survey demonstrate that there is no unanimity among the schools regarding the number of lecture hours to be devoted for instruction in public health, both general and dental. In the opinion of the writer, there are a number of schools

where the amount of time spent at present in teaching public health cannot be considered adequate. For while dentistry's participation in the broad field of public health is relatively new, its importance is well established. The field of dental public health has been recognized by the American Dental Association as a specialty of dentistry. The American Public Health Association in recognition of the value of dental public health established a section for dentistry in the association some years ago.

The basic objectives of dental public health adopted by the American Dental Association are to promote [1]:

1. Oral health by placing emphasis on the prevention of disease and oral maldevelopment.
2. Development of methods for the early detection and the control of such conditions when they are not prevented.
3. Development of the knowledge and attitudes that will motivate the dental profession to practice, the local health officers and other officials to sponsor, and the public to accept these preventive and control technics.

The American Dental Association has advocated for a number of years the development of community dental health programs as a means of improving the dental health of the people of the country. In a survey conducted by the Council on Dental Health of the American Dental Association, it was found that out of some 40,000 communities in the country approximately 5,000 had some type of dental health program.[3] Undoubtedly, there are a number of reasons why many communities fail to organize dental health programs. Some of the problems associated with the development of a community dental health program were brought out in a recent study conducted in Columbia County, N. Y., where it also was found that some of the obstacles emanated from the local dentists, such as lack of understanding of the objectives of public health.[4]

In view of the above, it may be reasonable to assume that a major contributing factor for the failure of a number of communities to organize dental health programs can be attributed to the fact that dentists have not received adequate indoctrination in public health during their undergraduate dental education. As a result, the dental practitioner does not have a clear picture of dental public health objectives and methods, and he is not always well equipped to assume his social responsibilities and to exercise his leadership by actively participating with other local groups in matters pertaining to the oral health problems of his community.

It is apparent that there is room for improvement in teaching public health to dental students. There is today, however, an increasing awareness among dental educators of the need for reexamining the contents of the present dental curriculum and for the necessity of allocating more time for some courses than that available at present. Undoubtedly, the teaching of public health comes under this category and merits serious consideration. As a prominent dental educator stated: "In the last fifteen years developments in the field of dental public health have been so striking that to ignore them in any teaching program is inconceivable." [5]

Toward this goal, it seems advisable to consider the creation of a Department of Public Health and Preventive Dentistry in each of the dental schools with a qualified full-time person as head of it. Such a step will be a decisive factor in improving and strengthening the teaching of public health. This proposed new department, however, could be designated simply as Department of Preventive Dentistry. In a thought-provoking report of the recent Conference on Preventive Medicine in Medical Schools, sponsored jointly by the Conference of Professors of Preventive Medicine and the Association of American Medical Colleges, the following statement appeared: "Thus, today, the

term preventive medicine has a broad meaning, including public health as only one special part of its general concern with all other aspects of health maintenance. This is a relatively new way of looking at the field."[6] Moreover, the advisability of including a course in preventive dentistry in the curriculum of the dental schools has been discussed and proposed in a recent article.[7] All the above should be given serious consideration in any discussion regarding the designation as well as the scope of the proposed creation of a new department by the dental schools.

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Association of Schools of Public Health Elects

The Association of Schools of Public Health, meeting in April at the University of Michigan, admitted to full membership the University of Montreal whose curriculum leading to the Diploma of Public Health had previously been accredited by the American Public Health Association.

Ira V. Hiscock, Sc.D., director, Department of Public Health, Yale University, was elected president to succeed Gaylord W. Anderson, M.D., director of the University of Minnesota School of Public Health. Other officers are:

Vice-President—Charles E. Smith, M.D., dean, School of Public Health, University of California, Berkeley

Secretary-Treasurer—James A. Crabtree, M.D., head, Department of Public Health Practice, Graduate School of Public Health, University of Pittsburgh

A Compilation of Epidemiologic Studies in Dental Caries

MAURY MASSLER, D.D.S.; J. J. PINDBORG, D.D.S., Dr. Odont.; and CLIVE MOHAMMED, L.D.S.

"The character of the curves suggests a 'growth' phenomenon," the writer of this study observes. It is a phenomenon familiar to and of moment to everyone in public health.

Early epidemiologic studies of dental caries consisted of the assessment of the number of persons suffering from the disease, i.e., having one or more carious teeth (Morelli, 1924).[1] Some attempts were made, sporadically, to determine the average number of carious teeth present in large population groups. It was not until Bodecker[2] in 1939 and Klein and Palmer[3] in 1940 more exactly defined the pattern of attack by dental caries that epidemiologic methods of assessment became better standardized and more widely useful. Since that time, a number of methods of assessing dental caries have been suggested and used. The most widely accepted method of scoring the caries attack rate is that defined by Klein and Palmer as the DMF rate, the average number of decayed (D), missing (M), and filled (F) teeth per person.

This compilation is designed to bring together and to analyze all available studies on the epidemiology of dental caries, especially those which present statistically valid data on the number of DMF teeth and tooth surfaces in large population groups at each age level from three to 17 years. It was hoped that such a compilation would serve the dual purpose of (1) presenting these data in readily available form for future comparative studies,* and (2) showing trends in the dental caries attack rates in different countries.

Material

All data were derived from the literature. Though a careful search was made for all published studies on the epidemiology of dental caries, no doubt a number of good studies were unintentionally omitted. We would be grateful if the authors of such studies would communicate with us so that their data can be included in future analyses.

A few studies could not be included because the data were not presented in the form of def or DMF rates and the original data could not be interpolated in this form (see Bibliography). A number of studies presented their findings in such condensed form that these could not be analyzed adequately. Studies based upon very small samples were omitted as were those limited to one or two age groups, since the major

* Since this study was initiated, an excellent review of the Epidemiology of Dental Caries by Sydney B. Finn has appeared in "A Survey of the Literature of Dental Caries," published by the National Academy of Science, National Research Council, Washington, D. C., 1952 (publication No. 225).

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objective in the present study was the analysis of trends in the caries attack rate in different parts of the world.

In the majority of the studies included in this paper, examination for dental caries was made by means of mirror and explorer, but without the aid of radiograms. Where the latter were used, notation to that effect is made.

Method

All data were analyzed from the figures presented in the original publication. In the older publications (prior to 1932) the DMF rates were computed from the raw data. In all instances, data for males and females were combined since these differences were small and because it was decided that the pooled data would provide a larger and more significant sampling. All decimals were adjusted to the nearest tenth. The resulting data were arranged in tabular form in the chronological order of the studies in Table 1. These data were then graphed in Figures 1–4. The curves represent point-to-point graphs.

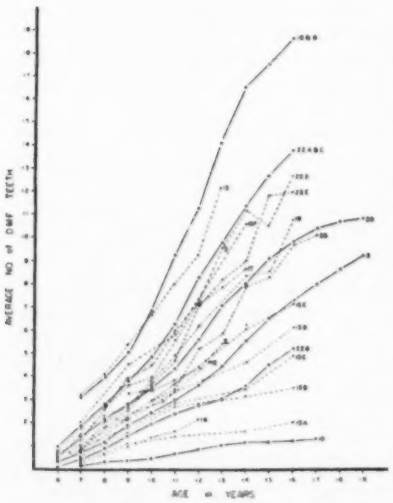

Figure 1—Graph showing dental caries attack (DMF) rates in permanent teeth as reported from various countries of the world. Numbers in graph refer to studies listed in Table 1.

Findings

The graph in Figure 1 shows that the trends in dental caries attack rates tend to follow a definite S-shaped pattern. There is a regularity in the rate of increase with age. The lack of helter-skelter criss-crossing of the lines in Figure 1 is striking in view of the fact that the methods used by each investigator were far from uniform. There is every reason to believe that each trend line in the graph must have a large inherent standard error. The uniformity of the curves suggest a basic regularity in the caries attack rate.

In general, the caries attack rates reported in the North European studies were relatively high. Denmark (Lind and Brams, 1941) and New Zealand (Hewat, 1948) showed the highest caries attack rate in the world. In India, the attack rate was very low (Shourie, 1941). In the United States the trend was midway between these two extremes. The lowest caries attack rate thus far reported in the United States appeared in the study by Dean, et al. (1950), for the City of Aurora, Ill., where the water contained 1.2 ppm of natural fluorides. It was highest in the nonfluoride areas of Muskegon and Grand Rapids, Mich., where the water was free of fluorides. Future studies will no doubt extend these limits in both directions.

In order to clarify the trends in different groups the "best" study, i.e., the study based on the largest number of cases examined, in each group was plotted separately in Figure 2. The distinct parallelism shown by the unsmoothed curves is striking. The caries attack rates for the primary teeth were

Table 1—Dental Caries Attack Rates as Reported by Various Authors in Different Areas of the World

AGE in YEARS	AVERAGE NO. PRIMARY TEETH AFFECTED PER PERSON																								
2																									
3																									
4																									
5																									
6	7.8																								
7	7.8																								
8	7.4																								
9	6.2																								
10	4.6																								
11	3.0																								
12	1.7	0.5	1.8	0.5			1.4																		
13	0.9	0.1	1.1	0.2			1.0																		
14	0.5			0.7																					
15																									

AGE in YEARS	AVERAGE NO. PERMANENT TEETH AFFECTED PER PERSON																								
5																									
6	0.8			0.3																					
7	1.6	2.0	1.7	0.7	1.0		3.2	0.3	2.8	0.6	3.1	0.2	0.8	0.5	0.7	1.0	0.8	1.0	2.1	0.5	0.4	1.0	0.7	0.8	0.4
8	2.2	3.0	2.9	1.2	2.0		4.2	0.4	3.5		4.1	0.7	1.7							1.1	1.1	1.8	3.8	1.5	1.5	0.8
9	2.7	3.3	3.9	2.0	3.4		5.4	0.4	4.1	2.2	5.4	1.0	2.1	1.0	1.6	1.8	2.2	2.4	4.6	2.0	2.0	2.8	3.9	2.2	2.9	1.8
10	3.1	3.4	4.8	2.5	4.2		7.1	0.5	4.8		6.7	1.3	2.7							3.1	2.7	3.6	4.9	2.6	2.9	2.2
11	3.7	3.8	5.8	2.8	4.9		9.2	0.7	5.8	3.0	8.0	1.8	2.8	1.4	2.9	2.9	3.7	3.7	5.9	4.0	3.7	5.5	3.9	4.8	4.4	3.4
12	4.4	4.3	7.8	3.7	6.6	3.8	11.3	0.9	6.7		9.2	2.1	2.8							5.4	6.4	7.0		6.2	5.7	5.1
13	5.2	5.3	9.3	4.5	7.4	4.8		1.1	8.2	4.6	12.1									7.5	8.2	7.8	9.4	6.8	7.1	5.8
14	6.1		9.3	6.1	5.6	5.6		1.2	9.2					1.6	3.1	3.5	4.6	6.0	10.6	8.4	8.7	8.6	16.5	8.3	8.1	8.1
15				6.7	6.6		6.5	1.2	10.0														17.5	8.5	9.2	8.2
16				7.2	7.2		7.2	1.2	10.3					2.0	3.4	4.9	6.0	7.1	8.0				18.6	10.7	9.9	9.6
17				7.7	7.7		7.7	1.3	11.0																	10.0
18				8.7	8.7		8.3		11.2																	
19				9.3	9.3																					

LOCALE																									
TOTAL NUMBER	1,146	3,220	1,216	1,841	1,841	1,368	6,853	1,368	6,853	1,240	1,240	1,068	1,068	2,294	396	2,294	396	1,540	1,540	1,540	1,540	1,476	1,476	731	687	2,294	1,540	1,540	1,540	1,540

compiled and analyzed as above and are presented in Figures 3 and 4. Here, again, the parallelism in the curves indicating the attack rates in different areas by different investigators is notable. As was expected, some studies showed a low caries attack rate in the primary dentition and a similarly low caries attack rate in the permanent dentition. However, surprisingly, in some studies the attack rate was "low" in the primary dentition, but "high" in the permanent dentition and vice versa (see Table 1 for details).

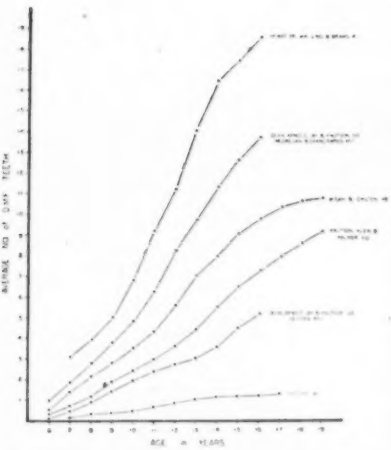

Figure 2—Individual studies plotted to show the parallelism in the caries attack rates in areas of high and low caries susceptibility.

Discussion

The analysis of the available data on the incidence of dental caries indicates that caries attack rates follow definite trends and appear to be orderly. The character of the curves suggests a "growth" phenomenon. This is undoubtedly due to the fact that dental caries is cumulative, i.e., the lesions cannot repair themselves and this, indeed, constitutes a "growth" process.

The analysis of these trends suggests that a channel system based upon "smoothed" curves as presented in Figures 2 and 4 might be set up to analyze trends in dental caries experience. Such a channel system would be very useful in (1) assessing the trend in dental caries experience in large population groups from relatively small samples, and in (2) the analyzing of the trend of caries experience in single individuals. A channel system (similar to the Wetzel's grid for physical growth) has been constructed (see Figures 5A and 5B). On the basis of a pilot study conducted in our clinic, we believe that the major features are correct. Additional data will undoubtedly modify some of the details of this graph.

Perhaps the most useful feature of such a channel system would be to study the caries experiences of family groups, i.e., to compare the relative susceptibility of parents, children, and siblings. A study of familial trends in dental caries experience using this channel system as a guide is now under way.

Summary and Conclusion

A compilation of the data available from different parts of the world on the epidemiology of dental caries revealed the fact that the caries attack rate may

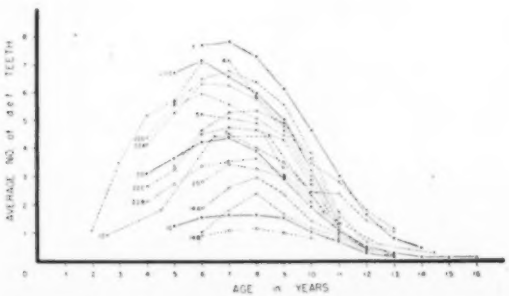

Figure 3—Graph showing dental caries attack rates in primary teeth (def) as reported in Table 1. Numbers refer to studies listed in Table 1.

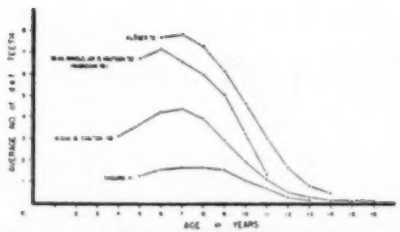

Figure 4—Individual studies plotted to show parallelism in the caries attack rates in areas of high and low caries susceptibility.

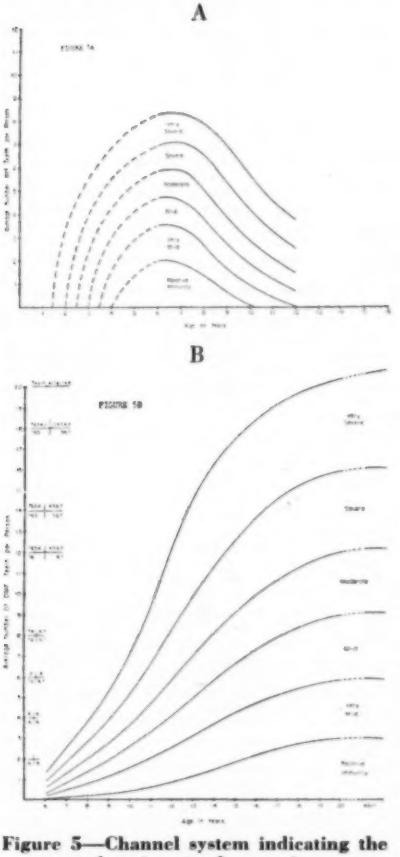

Figure 5—Channel system indicating the expected caries attack rates in persons with different degrees of caries susceptibilities. A, primary teeth; B, permanent teeth.

vary from a very high to a very low rate. In all instances the trend in the permanent dentition was S-shaped. The parallelism among these curves was striking.

A channel system based on these data is suggested for the longitudinal study of individual trends and for the evaluation of familial trends in dental caries susceptibility.

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The Fifth International Congress on Mental Health

Reports from Toronto are enthusiastic in describing the warmth, the friendliness, and the stimulating interchange of ideas during the International Congress on Mental Health at the University of Toronto, August 14–21, 1954. Held under the auspices of the World Federation for Mental Health, the congress was attended by more than 2,000 delegates from 48 countries. It was preceded by a two-day International Institute on Child Psychiatry and by several "Research Symposiums" which ran from three to 10 days each, including one on Problems of Partnership in Mental Health and Public Health, and a large one on Mental Health and Child Development. Concurrent with the Congress on Mental Health was the First International Congress on Group Psychotherapy. The Journal is indebted to Dr. Nina Ridenour for the conference highlights following.

Although the congress organizers disclaimed the accusation that the 77-page program was set up as an intelligence test, delegates sometimes grew suspicious when trying to find their way through it. The structure of the program, though complex, reflected the careful planning of the organizers. Mornings were devoted to Technical Sections (five of them) at which papers on a wide range of subjects were presented. Delegates were encouraged but not required to remain with the same Technical Section throughout the week. The first half of each afternoon was given over to a Plenary Session. The late afternoon was busy with Round Tables and Voluntary Discussion Groups which were arranged upon request. The theme of the entire congress was "Mental Health in Public Affairs."

Public health people would have felt right at home. Several of the more talked about papers were in this field. At one of the plenary sessions, Dr. G. R. Hargreaves, chief of the Mental Health Section of the World Health Organization, pointed out that 1954 is the centenary of the great cholera epidemic in London in which John Snow played such an important role with his recommendation for "removing the handle of the Broad Street pump." Dr. Hargreaves flagged this simple but momentous event for the attention of mental health workers as an example of the testing of a clearly formulated hypothesis and acceptance of implications, followed by appropriate social action. Dr. Hargreaves compared the attitudes of those who today scorn some of the present implications of psychiatric knowledge with those who in an earlier day "scoffed at ludicrous notions about the ill-effects of drinking sewage."

Other significant papers on mental and public health and the epidemiology of mental disorder stressed the difficulty of assessing the mental health status of a population, the need for more precise and sophisticated diagnostic criteria, and for assembling the type of data that will yield to classification and analysis.

One of the recurrent themes throughout the congress was the repeated plea for "more research, more research." All too often, however, this seemed to be chiefly a cry for miscellaneous information, however inchoate and amorphous. A definite hypothesis, with a clearly stated plan for testing it, is still relatively rare in the mental health field.

Another recurrent theme was the insistence on the need for more careful examination of the modes of "communication" within the field, and an increasing awareness of the confusion that results when people think they are talking about the same thing but are not.

Press coverage of the congress was remarkable. In the United States, it is well known that mental health meetings seldom rate much space in the daily press—unless there is a row between authorities to report. The Toronto papers devoted several columns each day to the meetings, and in one instance a whole page.

The six delegates from the U.S.S.R. were cordially received whenever they spoke. Their papers were a combination of straightforward descriptive reporting and propaganda about the collective state. Professor N. I. Ozeretsky, chief of the Psychiatric Division of the First Medical Institute in Leningrad, said that mental disease in Russia is decreasing and that because Russian children are healthy and happy, they easily pass tests that are failed by Western children. The Toronto Globe and Mail frivolously headlined this "Reports Little Reds in the Pink." It is not recorded how Communists feel about ascribed shades at the upper end of the spectrum.

Allen Weir Freeman

The passing on July 3 of Allen W. Freeman, M.D., emeritus professor of public health administration at the Johns Hopkins School of Hygiene and Public Health, Baltimore, has removed from among us a leader to whom many are indebted as students and as beneficiaries of his long public health service. Following his graduation from the Johns Hopkins Medical School in 1905, Dr. Freeman served with the Virginia State Health Department, 1908–1915, and was an epidemiologist with the U. S. Public Health Service, 1915–1917. He made a notable contribution as commissioner of health of Ohio, 1917–1921, during which years he laid the foundations for full-time local health service in that populous state.

In 1921 Dr. Freeman came to Johns Hopkins to take over the teaching in public health administration, carried in the two preceding years by Sir Arthur Newsholme as resident lecturer, and in 1923 was named professor. He served as dean of the school, 1934–1937.

Dr. Freeman's contributions to this professional society were numerous. His membership dates back to 1907 and he became a Charter Fellow in 1922. He served four terms as an Elective Councilor on the Governing Council and was President of the Association in 1943. Since his retirement from his teaching position in 1946 Dr. Freeman served in an advisory capacity with the Maryland State Department of Health and his contributions to the public good have continued. He was well known as the author of the volume "Five Million Patients," a story of the professional life of a health officer.

We shall remember Allen Freeman for his notable contribution through teaching and administration. We shall also remember him for the man that he was.

A Step Toward Professional Preparation

The Congress recently enacted a law creating a New England Board of Higher Education and granting the required Congressional consent for any two or more of the New England states to contract with others to provide greater opportunities for professional training. Each state entering the compact will contribute financially toward the higher education of its own students in the leading centers in any one of the other states. Facilities for present-day professional education, particularly in the health professions, are costly to establish and maintain. In addition, education in the several disciplines involved in public health can best be offered in institutions with extensive clinical and laboratory services—not usually available in less populous areas.

This compact tends to offset the gap between current tuition charges and the growing costs of higher education, thereby strengthening existing institutions, while it helps to meet the increasing demand for professionally trained personnel. Massachusetts participation has already been authorized by the State Legislature, and the pact has received enthusiastic support among educational and other leaders throughout New England. Its progress will be watched with interest by all who are concerned with the bettering of public health administration.

National Nurse Week, October 11–16

President Eisenhower has proclaimed October 11–16 as National Nurse Week. In passing the bill authorizing the proclamation Congress hoped to encourage public recognition of the role of nursing in the nation's health, welfare, and defense. The theme for National Nurse Week is "Progress in Nursing Means Better Health for the Nation." The American Nurses' Association and the National League for Nursing are cooperating to stimulate activities and channel suggestions for the observance by state and local groups.

The year 1954 is the centenary of the work of Florence Nightingale in the Crimea, thus representing 100 years of professional nursing.

Credit Lines

The Journal cannot furnish copies of items mentioned in Credit Lines. Please send requests to the addresses given.

Polio Recovery Dramatized

"New Fountains," written and produced by the American Theatre Wing for the National Foundation for Infantile Paralysis, was devised to help audiences gain new insight into the needs and problems of the physically handicapped. It is the story of the crisis a young girl faces following an attack of polio. It is described as "a warm, vital drama" centering around home and school relationships. It can be staged without scenery and with but a few simple props and does not require a professional cast.

Any community group in the country may produce the play with amateur or professional cast, except within a radius of 50 miles of New York City. There performing rights are reserved for the American Theatre Wing Community Plays.

Detailed casting and production directions for the benefit of untrained actors are included, as well as a discussion guide interpreting the theme of the play with suggestions for a discussion of the content and meaning following the performance. National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y.; free.

Field Training of Health Educators

Among the several explorations in the area of field training for health educators is a development in New England. It started with a New England regional committee in 1952 which made a study of the current status of field training for health educators (A.J.P.H. 43:480 (Apr.), 1953.)

In October, 1953, a New England Conference on Field Training for Graduate Students in Health Education was held in Northhampton, Mass., under the sponsorship of the New England Health Education Association and the Schools of Public Health of Columbia, Harvard, and Yale Universities. The conference report has now been published. It represents another addition to the growing literature discussing this problem. Many of the questions it raises are applicable to other areas and will serve to guide other conferences in other times and other places.

The report was prepared by Margaret M. Blizard, chief coordinator of health education, Massachusetts Department of Health, and Mary Lou Skinner, regional health education consultant, Public Health Service. Production was done jointly by the Divisions of Training and of Health Information in the Massachusetts Department of Health. No information as to availability and price.

How Medical Care Costs Are Met

A little known study conducted in 1953 by the National Federation of Settlements and Neighborhood Centers surveyed the costs of health services for some 300 families in eight states through 15 cooperating settlement houses. The recently published report, "Health Costs and How Met," indicates how these families met the costs. As in the 1950 Henry Street Settlement study, there is forceful evidence of the inadequacies of present insurance plans. The "serious lack of coverage against the more frequent and regular expenses entailed in maintaining health" stands out.

Because the developments of medical science are beyond the reach of many citizens they "are haunted by a dread of sickness and its effects upon the family." Removing this fear through adequate insurance plans, the report indicates, would be a first step in the prevention of illness and building a healthy community. The reader will be interested in comparing these data with the information reported by the Health Information Foundation's National Family Survey of Medical Costs and Voluntary Health Insurance.

The report was prepared by Nancie Dawson, warden of Birmingham Settlement, England, while on a fellowship with the federation. It is available from the National Federation of Settlements and Neighborhood Centers, 129 E. 52nd St., New York 22, N. Y.; 25 cents.

Swimming Pool Annual

"Swimming Pool Data & Reference Annual, 1954," the 22nd Annual edition, presents several articles dealing with the general construction, equipment, and operation of swimming pools. Relatively new topics discussed include diatomite filters and various algaecides. Once again the extensive advertising sections should prove useful to public health workers as a reference source for equipment. Hoffman-Harris, 425 Fourth Ave., New York 16, N. Y.; $3.

Handicapped Homemakers

This report of the "Leader's Workshop on Principles of Work Simplification Applied to Problems of Physically Handicapped Homemakers," held in Storrs, Conn., in June, 1953, brings together many useful sources of information. Public health nurses, health educators, and others in the local health department will find the specificity of the lists of books, films, equipment, and studies relating to the problems of organizing home-making for disabled damsels most helpful. The report actually gives the addresses, prices, and other such mundane data.

Single copies should be available from your state Vocational Rehabilitation Office or from the Office of Vocational Rehabilitation, Department of Health, Education and Welfare, Washington 25, D. C.

Chicago Museum Nutrition Exhibit

A new kind of educational exhibit, "Food for Life," dramatizing the story of nutrition has recently been opened by the Museum of Science and Industry in Chicago. It portrays the extent of man's knowledge about foods, provides basic information as a guide in selecting daily diets, explains the role of the soil, plants, and animals in providing proper food for human beings, and tells the story of food processing. A feature of the exhibit is a display of live baby pigs, lambs, and other young farm animals in an air-conditioned nursery, illustrating nutrition in practice.

In opening the exhibit, museum president, Major Lenox R. Lohr, said, "This is a really unique exhibit; 'Food for Life' marks the first time the nutrition story has ever been told in a museum on such a large scale."

The exhibit was built and sponsored by Swift and Company as a public service contribution. It has established an attractive booklet summary of the exhibit which should be of help to groups—school children, clubs, etc.—that might want to plan a visit to "Food for Life." Swift and Company, Chicago 9, Ill.

Worth Acquiring

"Understanding Your Teen-Ager," designed particularly for parents, has a lot of good sense about the eternal con-

flict between the youngster trying to grow up and his parents. It is humorously illustrated and printed in attractive colors. Metropolitan Life Insurance Company, 1 Madison Ave., New York 10, N. Y. Free.

"Serving Successful Snacks and Meals" has been devised by the Public Health Committee of the Paper Cup and Container Institute as a diplomatic way to carry rules of sanitation to amateur food handlers in churches, clubs, and other groups. It gives pointers on budget, planning methods, equipment, quantity cooking as well as on protecting health. The fact that paper containers are recommended both in the interest of saving drudgery and of health does not make the booklet any less useful or acceptable. Public Health Committee Paper Cup and Container Institute, 250 Park Ave., New York, N. Y. Sample copies free.

"What Do We See in '53 for Guidance and Health" is the report of the Coordinated Conferences on Guidance, Personnel Services, and Health Education held at the University of Wisconsin during the 1953 summer. Among the keynote speeches here reproduced is "A Look Ahead at Child Health" by Thomas E. Shaffer, M.D., professor of pediatrics, Ohio State University.

The final address, "Look in Both Directions," by C. Gilbert Wrenn, professor of education, University of Minnesota, contains a quoted "Voice of the Low IQ" that is priceless in expressing through the mouth of the Low IQ himself the limitations of the intelligence tests and the "gods" who administer them. The editors are Warren H. Southworth, Dr.P.H., professor of education, University of Wisconsin, and Robert Fitzgerald, Kramer Business Service, Gay Building, Madison, Wis. Available from the latter; $1.

"New Hope for the Retarded Child" is Public Affairs Pamphlet No. 210. Written by Walter Jacob, director of the Training School at Vineland, N. J., with a foreword by Pearl Buck, the novelist. This should be in the hands of every person who is called on to help parents understand their retarded child and the resources available for his care. Public Affairs Pamphlets, 22 East 38th St., New York 16, N. Y.; 25 cents.

"Organize Your Community for Traffic Safety" is the report and recommendations of the White House Conference on Highway Safety held in February, 1954, and attended by about 2,300 persons.

The foreword says that "This booklet tells you how you can tackle the traffic problem in your own community. It outlines for you the community-organization plan recommended by the 1954 White House Conference on Highway Safety."

How a community is organized, what farm, labor, business, and women's groups can do, what part organizations and public officials can play, and how newspapers and the press generally can help are all spelled out. In addition, there are case histories of traffic safety programs in representative communities.

In order to assure continuity of the work started at the conference, the President's Action Committee for Traffic Safety was appointed. One of its major services is to help communities set up traffic safety organizations. Its director is Rear Admiral H. B. Miller, USN Ret., General Services Building, Washington 25, D. C.

Books and Reports

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Lung Cancer—By Seymour M. Farber. Springfield, Ill.: Thomas (301–327 East Lawrence Ave.), 1954. 136 pp. Price $4.75.

This is a timely monograph on a much debated subject which is steadily growing in its importance. It is a welcome addition to the series of American Lectures in Chest Diseases. The content is based upon 1,070 autopsies, performed in 19 California hospitals and the cytological studies on 3,000 lung cancer suspects at the University of California Hospital laboratory, plus the data from the author's own extensive private practice.

The text is easy to read, it summarizes current knowledge on lung cancer in the light of historical experience; it is logically arranged by chapters devoted to etiology, histopathology, clinical features, roentgenology, further diagnostic studies, surgery, nonsurgical technics and the conclusion. The text is augmented by nine graphs, three tables, four microphotographs in black and white and six in color, and four pages with sixteen roentgenogram reproductions.

The author stresses the importance of "total care of the patient" and points to the unsatisfactory record in the diagnosis of bronchiogenic carcinoma: of the 1,070 morphologically proved cases, in 61 per cent there was no positive diagnosis made prior to autopsy; furthermore, it took as long to make the diagnosis of lung cancer in 1949 as it had in 1935. Other sobering notes include the emphasis on the earlier application of available diagnostic technics and on saving the patient unnecessary surgery by the judicious use of chemotherapy.

The author observes that lung cancer patients often present a history compatible with chronic bronchial allergy, frequently attributable to the habitual use of tobacco. The discussion of nonsurgical technics includes an excellent summary of specific chemotherapy, as well as hormone and irradiation therapy. Space does not permit elaboration on the practical manner in which data are sorted and summed up. Most physicians and other members of the public health team will find this a ready reference volume; though small in size it is packed with well chosen information. LEONID S. SNEGIREFF

First Aid and Resuscitation—By Carl B. Young, Jr. Springfield, Ill.: Thomas (301–27 East Lawrence Ave.), 1954. 338 pp. Price, $8.50.

Each day in any large community, dozens of critically stricken people are first attended by ambulance drivers, police, firemen, rescue squads, and industrial nurses. Medical societies and public health officials too often have paid scant attention to the training and work of lay people who frequently render first aid. The author suggests that many lives can be saved through adequate service arrangements, proper training of personnel, and medical supervision of the work. His book, directed at these lay people and nurses, reflects much practical experience. It is designed for those who already have had basic first aid education; accordingly

some of the common technics are not described and others are given expanded discussion.

Considerable attention is given to transportation and to ambulance equipment. Among other topics are cardiac emergencies, unconsciousness, respiratory emergencies, including even those of the newborn and of bronchial asthma, cerebral vascular accidents, alcoholic intoxication, poisoning, electric shock, submersion, burns, and suicides. Precipitate labor is not included.

With some topics there is an elementary discussion of underlying physiology and pathology. Occasional errors are noted, as in listing high blood pressure as a major form of heart disease, but over-all the information is sound and useful.

The book is profusely illustrated, revealing critical injuries and stark tragedies, helpful measures and common errors in first aid. The book is interesting, superior for its purposes and should prove useful.

CARL J. POTTHOFF

Mayo Clinic Diet Manual — By the Committee on Dietetics of the Mayo Clinic (2nd ed.). Philadelphia, Pa.: Saunders (West Washington Square), 1954. 247 pp. Price, $5.50.

This is a revision of the original Mayo Clinic Diet Manual published in 1949. Since that date more accurate tables of food composition have been published and the Food and Nutrition Board Recommended Dietary Allowances have been revised. These changes are reflected in this revision of the diet manual.

The committee has prepared a comprehensive manual but cautions that it "should serve only as a guide to physicians ordering diets and to dietitians planning and serving food for patients."

The chief values of this book to public health workers are (1) it provides authentic information to offset the much misquoted "Mayo Reduction Diet," and (2) many public health nutrition services offer consultation to small hospitals and nursing homes where an authentic source of therapeutic diet information is needed.

The detail and technicality of the material is such that the consultant will undoubtedly use the manual as a reference and in her conferences with physicians and not recommend its purchase by nursing homes or small hospitals without the services of a professionally trained dietitian.

ALICE H. SMITH

True Adventures of Doctors — By Rhoda Truax. Boston, Mass.: Little Brown (34 Beacon St.) 1954. 216 pp. Price, $2.75.

This book is part of the True Adventure Library, a series intended to unfold for the early teen-ager the drama and adventure to be found in life. It is a collection of stories, fourteen in all, covering discoveries of medical men made over the past four hundred years.

Ambroise Pare's contribution to early surgery, Edward Jenner's work with smallpox, Alexander Fleming's discovery of penicillium—these and other stories are told in a style which should appeal to youngsters. Perhaps some who read the book will be influenced to consider medicine as a career. REES JONES

The Macmillan Medical Dictionary —Edited by Sir Cecil Wakeley. New York: Macmillan (60 Fifth Ave.), 1954. 471 pp. Price, $6.95.

This dictionary, which has been published in England under the title the Faber Medical Dictionary, aims to be a concise and comprehensive medical dictionary primarily for the use of persons administering the National Health Service.

Comparison with frequently used American medical dictionaries indicates somewhat fewer definitions and a more

abbreviated text. Cuts and tables are notable by their absence. Much emphasis is placed on the derivation of terms.

Specialists in each field will wish to test such a dictionary for special terms. The definition for "epidemiology" as the science of epidemics leaves much to be desired, but the wider connotation seems not to have made its way into any current dictionaries. No attempt is made to provide information on incubation periods and such facts relating to the communicable diseases. A special emphasis has been placed on pharmaceuticals, naturally reflecting much British terminology.

On the whole, this seems to be an acceptable dictionary and to have achieved its purpose of a concise and accurate volume.

REGINALD M. ATWATER

The Cliff's Edge—By Marie Hackett. New York: McGraw-Hill (330 West 42nd St.), 1954. 245 pp. Price, $3.50.

This is a true account of the effect of mental illness in the breadwinner of a fairly typical American family. It is told simply and convincingly by the wife of the patient and, because it reveals our professional shortcomings, as well as being a very human story, it is suggested reading for both social and health workers. So many irritating things happened to Mrs. Hackett unnecessarily! Do we perhaps take our routines too much for granted? Do we assume the family "understands" just because they are intelligent, poised, and self-controlled? Can we not do better in rehabilitating a paroled patient? Must a person like Mrs. Hackett travel the road alone? Granted that she made false moves and did not ask for help in time, but there are points in her report where one must pause and question.

At a time when mental health and the care of mental illness are of current concern to the nation, this unpretentious account aids in supplying proof that reforms are needed.

DOROTHY DEMING

Heating-Ventilating-Air Conditioning Guide, 1954 (Vol. 32)—New York: American Society of Heating and Ventilating Engineers (62 Worth St.), 1954. 1616 pp. Price, $10.00.

The 1954 edition of this book is not only the usual well written reference book equal in quality to its predecessors, but it carries out the purpose of its editors to improve each new edition by including new data and improving on that previously presented.

The technical data section now numbers 1128 pages and provides a wealth of information for reference and study in the three fields concerned. The guide is not a textbook for beginners; it presupposes a certain knowledge of the subject, but even so, there are many portions which can be of inestimable value to the student.

A new chapter on Residential Summer Air Conditioning has been added; information on Water Vapor and Condensation in Construction is now honored with an enlarged chapter of its own; Chapter 13, Cooling Load, has been revised with the elimination of some tables and figures, consolidation of context, and inclusion of new data; good new material on Industrial Oil Burning Equipment is found in Chapter 15; some information on industrial gas burning equipment appears to have been omitted from this volume, but probably not to its detriment. A new section on Panel Heating for Snow Melting is included in Chapter 24, while Chapter 42 on Electric Heating has been considerably expanded.

The glossary has been enriched with new definitions, and new research data of the society are presented on the effect of shading of glass and in the enlarged chapter on Air Distribution.

An edge index is provided for rapid opening to any desired section or chapter of the text or to any section of the catalogue data. This is a great improvement over previous issues.

Although some data possibly could be presented in a slightly different manner, e.g., Figure 4, page 1106, locations for pitot tube traverse could be expressed as percentages of the diameter from the outside edge of the pipe to make point location in the field more simple, in general, the information is straightforward and as complete as present-day knowledge will permit. FRED INGRAM

Home Injuries—By C. J. Velz and F. M. Hemphill. **Home Injuries.** 81 pp. **Procedure Manual (Appendix A)** 191 pp. **Environmental Appraisal (Appendix B)** 75 pp. Ann Arbor, Mich.: University of Michigan School of Public Health, 1953.

This volume and its two detailed appendixes represent the final report of a two-year study of the incidence and characteristics of nonfatal accidental home injuries in a representative midwestern area. This study, supported by a Public Health Service research grant, was conducted by the Department of Public Health Statistics of the School of Public Health, University of Michigan, during 1951–1952, using sample survey technics in Washtenaw County, Mich.

This project, filling a long need for research in the home accident field, utilized an areal probability sample, trained interviewers, and accepted analytical technics of biostatistics and survey methodology. Interviews obtained from the 2,456 dwelling units (98 per cent of the selected sample) showed that, within the criteria established for the study, 388 "major" injuries and 894 "minor" injuries were incurred by the nearly 8,000 persons surveyed in this project.

In addition to classifications of demographic and basic accident characteristics, this report includes correlative tabulations of many of the causative and predisposing factors associated with accidental home injuries. The content of this report, representing one of the first and most intensive studies of these features, is enhanced by graphical presentations of the data and by well chosen illustrations of significant accident hazards.

In addition to the analyses and conclusions reported in this publication, the description and evaluation of the methodological technics utilized in this survey should serve as a timely resource for others who may conduct additional investigations of the home accident problem.

Appendix A, entitled "Procedure Manual," includes the Interview Schedule, Injury Report Form, Environmental Appraisal Form, and instruction technics for the field and office processing of each. Detailed tabulations of the hazardous characteristics of home environments are included in Appendix B, "Environmental Appraisal."

The detailed research report presented in this publication and its two separately bound appendixes should serve as a valuable source of experience and reference for those with particular interests in the causative aspects of the home accident problem.

FREDERICK S. KENT

Father Relations of War-Born Children—By Lois Meek Stolz and collaborators. Stanford, Calif.: Stanford University Press, 1954. 365 pp. Price, $4.00.

Dr. Stolz is acting professor of psychology at Stanford University. The study was made under the auspices of the National Institute of Mental Health of the Public Health Service. It covers 19 families who were separated during the pregnancy of the mother when the

father went into service and reunited after the first child was at least a year old. The fathers were students at Stanford.

This study focuses on the relations of fathers with their first children under the stress situation of separation. These children and fathers are compared (both from the point of view of differences and of similarities) with families of the same socioeconomic status, age, and sex of children in which there was no separation. The relationship of father and child is also evaluated in the total family constellation when the father returned from service.

The method of the study was carried out through extended interviews with fathers and mothers, observations of social behavior of the children in group situations with peers and adult leaders, and projective play situations. Because the study was made of a particular socioeconomic group, the author warns against its application to all groups.

The study shows that war-separated fathers when they returned had major problems in assuming the role of the head of the family, such as difficulties in starting a vocation, re-establishing relations with their wives, establishing relations with the unknown child, and problems in the roles of breadwinner, husband, and father. Some of these problems were anticipated by the fathers, but not that of adjustment to their first-born children. There were more complications in the war-separated fathers than in the nonseparated fathers, because of disagreements with the wife's family and because of differences between husband and wife in child-rearing methods. Because of the need to adjust to the various problems at the same time, greater anxiety was evidenced regarding vocational selection and economic support of the family.

The war-separated fathers reported that the child's immediate response to the father was shy, withdrawing, unresponsive behavior. The child denied any affection for the father, refused to be cared for by him, and interfered in the father's relations with his wife in some cases. The father responded to the child with criticism of the child's behavior, especially of the child's dependence on the mother and his obedience to adults. These attitudes of fathers resulted in alienation of their first-born children, resulting in rejection of the fathers by the children. The greatest concern of war-separated fathers was in regard to the child's eating; fathers tended to force food which the child refused. Similarly, these fathers were more concerned with the child's elimination, sleeping routines, and bed-wetting than the nonseparated fathers. They were also more annoyed by the child's whining and thumb-sucking and in his relations with other children. The war-separated children were more withdrawn, rejected by others and, in the case of boys, less masculine in their behavior than the children of nonseparated fathers. However, the nonseparated fathers seemed to show more annoyance with the dressing behavior of their children.

The children of war-separated fathers showed more fears of a serious nature and more overt expression of tensions. In group situations they were not able to establish or maintain associations with other children as skillfully as the nonseparated children and expressed unfriendliness more directly, but they were often more sympathetic to the difficulties of other children. They tended to be more dependent and demanding and less negative with adults and showed compulsive obedience to adult authority. They also were more aggressed against than aggressing, but when they did express their aggression, it was more unfriendly and hostile than the nonseparated children. They lacked warmth and affection for anyone but the mother.

This study, carefully carried out, presents valuable data for all persons in the health field who will be working with the children of war-separated families and indicates the areas in which these children will have difficulty. The report also includes a valuable bibliography of references on the subject. It is an enlightening and helpful study.

ELIZABETH P. RICE

The Dynamics of Virus and Rickettsial Infections. International Symposium Sponsored by the Henry Ford Hospital, Detroit, Michigan—October 21, 22 and 23, 1953—Frank W. Hartman; Frank L. Horsfall, Jr.; and John G. Kidd, Editors. New York: Blakiston (575 Madison Ave.), 1954. 461 pp. Price, $7.50.

This volume contributes within one cover an excellent and convenient appraisal of current work and thought in this, the most rapidly advancing branch of microbiology. Naturalist, physicist, chemist, microbiologist, and clinician all take part in the attack on the problems of viral infections and one lays aside the volume impressed with the potentiation which results from the contributions by such varied disciplines and stimulated by the new pathways which are opened.

As is to be expected from a collection of 33 addresses such as these, there is considerable unevenness of presentation. The committee responsible for the symposium is to be congratulated on the careful way in which each of the various problems was chosen for consideration so as to bridge the thought from the preceding paper to the one following. The speakers themselves were well chosen to present the different facets. Despite this, some of the papers disappoint by reason of their facile dismissal of the complexities of the problems; others because of generalizations which are unjustified by the present state of our knowledge and may be positively misleading.

It is regrettable that, perhaps in the interest of prompt publication, so many typographical errors have been permitted to remain in text and tables.

GEOFFREY W. RAKE

Advances in Cancer Research—Edited by Jesse P. Greenstein and Alexander Haddow (Vol. II). New York: Academic Press (125 East 23rd St.), 1954. 530 pp. Price, $11.00.

This is the second of a series of volumes calculated to sum up the steady progress which is being made in cancer research. It serves as a central authoritative source which encompasses the current views of outstanding researchers; each deals with a phase of the problem from extensive personal experience in a special field.

The central theme of carcinogenesis is comprehensively reviewed in conjunction with tumor pathogenesis by I. Berenblum; the nature of the carcinogenic response, the genetic factors at work, the influences of age, sex, hormonal, and dietary factors, as well as the effect of solvents on carcinogenesis, are well summarized.

The survival and preservation of tumors in frozen state and the resistance of tumor cells to freezing and thawing is discussed by James Craigie.

Energy and nitrogen metabolism in both human and experimental cancer are particularly well summarized by Leonard D. Fenninger and G. Burroughs Mider of the National Cancer Institute.

Experimental Cancer Chemotherapy is clearly discussed by C. Chester Stock under the headings of Test Methods and the Materials Tested; the latter include synthetic chemicals such as nitrogen mustards, the vitamin antagonists, steroids, and many others, which are individually considered, as are chemotherapeutic materials of natural origin

obtained from animals, higher plants, microorganisms, and viruses.

Peter Alexander effectively sums up the current knowledge of the reactions of carcinogens with macromolecules; G. M. Badger, the chemical constitution and carcinogenic activity, while Austin M. Brues covers the status of ionizing radiations and cancer. The clinical use of nitrogen mustards is summarized by Calvin T. Klopp and Jeanne C. Batemen; the Genetic Studies in Experimental Cancer by L. W. Law are well illustrated and include many practical charts which are not readily accessible in a single text. The role of viruses in the production of cancer completes a noteworthy chapter by C. Oberling and M. Guerin.

This is truly an encyclopedic volume devoted to the special advances in cancer research, written and edited by a group of scientists of international reputation. It is a worthy addition to every scientific library.

The language is clear and understandable throughout; the statistical data and technical procedures are summarized in 50 tables, augmented by 38 figures and plates, and some 158 formulas. There are 66 pages of bibliography, 25 pages devoted to the index by authors, and 12 pages to the subject index. This volume is particularly recommended to all who teach cancer and to those concerned with research in related areas; interested physicians and other members of the public health team will find the text very enlightening and of considerable usefulness as a reference volume.

LEONID S. SNEGIREFF

Laboratory Instruments. Their Design and Application—By A. Elliott and J. Home Dickson. New York: Chemical Publishing (212 Fifth Avenue), 1953. 414 pp. Price, $7.50.

This book is highly recommended for libraries in institutions having the necessary staff and tools to design and construct their own equipment. It contains a wealth of information on materials and their treatment for the construction of scientific instruments. For their design there are concise and complete descriptions and instructions, accompanied by many tables, diagrams, and illustrations.

References are largely to English sources and trade names which may be difficult to identify in the United States. There are undoubtedly sources of comparable material in this country.

This book is not recommended as a source of information concerning the application of commonly used instruments in the average clinical or public health laboratory which is not concerned with construction of its own equipment.

JOHN K. MILLER

Handbook of Tropical Dermatology and Medical Mycology—By R. D. G. Ph. Simons, Editor (Vol. II). Houston, Tex.: Elsevier Press (402 Lovett Blvd.), 1954. 1705 pp. Price, $15.00.

The appearance of this second volume represents an achievement. It was pointed out in connection with the appearance of Volume I (A.J.P.H. 43, 3:349 (Mar.), 1953) that the authors had achieved their aim, "a concise and comprehensive handbook covering every tropical skin affection with a completeness never before achieved in a single work, written by a team of 80 medical specialists from all parts of the world."

Volume II considers diseases due to animal parasites, those due to fungi, to allergy, malnutrition and metabolic disturbances, to tumors, and miscellaneous conditions.

This is a source book to look up rare and puzzling skin conditions, especially from the tropics. The illustrations are excellent. The authors are to be congratulated. REGINALD M. ATWATER

Books Received

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

AMERICAN NURSING—HISTORY AND INTERPRETATION. Mary M. Roberts. New York: Macmillan, 1954. 688 pp. Price, $6.00.

BASIC CONCEPTS IN COMMUNITY PLANNING FOR THE CEREBRAL PALSIED. Morris Klapper. New York: United Cerebral Palsy Associations of New York State, Inc., 1954. 44 pp.

BELA SCHICK AND THE WORLD OF CHILDREN. Antoni Gronowicz. New York: Abelard-Schuman, 1954. 216 pp. Price, $3.75.

CHALLENGES GALORE IN '54 FOR GUIDANCE AND HEALTH. University of Wisconsin and the Wisconsin State Board of Health. Madison, Wis.: Kramer Business Service, 1954. 79 pp. Price, $1.00.

CONCEPT OF SCHIZOPHRENIA, THE. W. F. McAuley. New York: Philosophical Library, 1954. 145 pp. Price, $3.75.

DIRECTORY FOR EXCEPTIONAL CHILDREN 1954. Edited by E. Nelson Hayes. Boston, Mass.: Porter Sargent, 1954. 96 pp. Price, paper, $1.00, cloth, $2.20.

EDUCATORS GUIDE TO FREE FILMS 1954 (14th Annual Edition). Randolph, Wis.: Educators Progress Service, 1954. 566 pp. Price, $6.00.

ELEMENTARY TEACHERS GUIDE TO FREE CURRICULUM MATERIALS 1954 (11th ed.). Randolph, Wis.: Educators Progress Service, 1954. 332 pp. Price, $5.50.

ENCYCLOPEDIA OF CHILD CARE AND GUIDANCE. Sidonie Matsner Gruenberg, Editor. New York: Doubleday, 1954. 1016 pp. Price, $7.50.

FEDERAL TAXES AND THE MEASUREMENT OF STATE CAPACITY. Selma Mushkin and Beatrice Crowther. Washington, D. C.: U. S. Dept. of Health, Education, and Welfare, Division of Public Health Methods, 1954. 91 pp.

GUIDE TO PATIENT CARE, A. Georgia Hospital, Nursing Procedure Manual. Atlanta, Ga.: Georgia State Dept. of Public Health, Division of Hospital Services, 361 pp. Price, $3.00.

HUMAN RELATIONS IN ACTION. H. Edmund Bullis and Cordelia W. Kelly. New York: Putnam's, 1954. 86 pp. Price, $1.50.

METABOLIC INTERRELATIONS WITH SPECIAL REFERENCE TO CALCIUM. Transactions of the Fifth Conference January 5-6, 1953. Edward C. Reifenstein, Jr., Editor. Packanack Lake, N. J.: Josiah Macy, Jr. Foundation, 1954. 386 pp. Price, $5.00.

METHODOLOGY OF PLANNING AN INTEGRATED HEALTH PROGRAMME FOR RURAL AREAS. Second Report of the Expert Committee on Public Health Administration. WHO Technical Report Series No. 83. New York: Columbia University Press, 1954. 48 pp. Price, $.25.

NONTUBERCULOUS DISEASES OF THE CHEST. Sponsored by the American College of Chest Physicians. Edited by Andrew L. Banyai. Springfield, Ill.: Thomas, 1954. 1113 pp. 255 illus. Price, $18.75.

NUTRITION UNDER CLIMATIC STRESS—A SYMPOSIUM. Edited by Harry Spector and Martin S. Peterson. Chicago, Ill.: Quartermaster Food and Container Institute for the Armed Forces, 1954. 203 pp. Limited Free Distribution.

PRACTICE OF ALLERGY. Warren T. Vaughan and J. Harvey Black (3rd ed.). St. Louis, Mo.: Mosby, 1954. 1164 pp. Price, $21.00.

PROTOZOOLOGY. Richard R. Kudo (4th ed.). Springfield, Ill.: Thomas, 1954. 966 pp. Price, $10.75.

PUBLIC ADMINISTRATION ORGANIZATIONS: A Directory, 1954. Frank B. Cliffe, Editor. Chicago, Ill.: Public Administration Clearing House, 1954. 150 pp. Price, $2.50.

SHOCK AND CIRCULATORY HOMEOSTASIS. Transactions of the Third Conference, September 14-16, 1953. Harold D. Green, Editor. Packanack Lake, N. J.: Josiah Macy Jr. Foundation, 1954. 230 pp. Price, $3.50.

SOCIOLOGY OF THE PATIENT, THE. Earl Lomon Koos (2nd ed.). New York: McGraw-Hill, 1954. 269 pp. Price, $4.50.

TEXTBOOK OF PEDIATRICS. Edited by Waldo E. Nelson (6th ed.). Philadelphia, Pa.: Saunders, 1954. 1581 pp. 478 fig. Price, $15.00.

THOUSAND FAMILIES IN NEWCASTLE UPON TYNE, A. An Approach to the Study of

Health and Illness in Children. James Spence, W. S. Walton, et al. New York: Oxford University Press, 1954. 217 pp. Price, $3.00.

VOLUNTARY MEDICAL CARE INSURANCE. A Study of non-profit plans in Canada. Ottawa, Ont., Canada: Research Division, Dept. of National Health and Welfare, 1954. 210 pp.

WATER SUPPLY AND WASTE-WATER DISPOSAL. Gordon M. Fair, John C. Geyer, and J. C. Morris. New York: Wiley, 1954. 973 pp. Price, $15.00.

WORLD HEALTH ORGANIZATION, THE. Bulletin 10, Rabies, pp. 703-866. New York: Columbia University Press, 1954. Price, $1.50.

WORLD HEALTH ORGANIZATION: MONOGRAPH SERIES, No. 23. Laboratory Techniques in Rabies. New York: Columbia University Press, 1954. 150 pp. 52 Illus. Price, $3.00 paper bound, $4.00 cloth bound.

A Selected Public Health Bibliography with Annotations

Dolor Suburbia—"Our suburbs are the fastest growing areas of the country"—and often the fastest growing sanitary headaches. Significant details about a number of our country's metropolitan areas are spread out in this paper which features a useful chart of population increases (inside and outside central cities) by decades.

ANON. Suburban Population Growth. Statist. Bull. Metrop. Life Insur. Co. 35, 7:1 (July), 1954.

Unpleasant Thought for the Month—"Poultry constitutes one of the important reservoirs of disease organisms affecting man . . . transmitted either during the preparation of poultry for market or through the consumption of poultry products."

ATKINSON, J. W. Progress Report on PHS Model Poultry Ordinance. Modern San. 6,7: 27 (July), 1954.

Followers of Montefiore—Forty questions, calling for solid answers rather than expressions of pious intentions, are posed as a test of home-care programs. Thirty-odd such services are now in operation, their success meaning so much to public health administration.

BLUESTONE, E. M. The Principles and Practice of Home Care. J.A.M.A. 155, 16:1379 (Aug. 14), 1954.

Another Credit for G. G.—It is generally assumed that subclinical polio infections immunize most people before age 20. If gamma globulin prevented this beneficient process, its wide use might have disastrous results. The study reported here indicates that the globulin treatments do not interfere with subclinical infection immunization.

BROWN, G. C., et al. The Effect of Gamma Globulin on Subclinical Infection in Familial Associates of Poliomyelitis Cases. J. Immunol. 73, 1:54 (July), 1954.

Nursing-Teaching—It used to be that the hospital nurse's prime function was to give the ordered bedside care; in industry it was to render first aid; and in school to check on truancy. Preparation for the more adequate jobs called for in today's broader services necessitates a lot of education in many, many areas: this is the burden of a dis-

cussion which many health people in addition to nurses will find worth reading.

CARL, O. The Professional Nurse's Responsibility in Health Education. Nursing Outlook 2, 8:431 (Aug.), 1954.

Imported Ammunition — In case foreign experience is needed to corroborate our domestic findings, this report of caries incidence in a county of Great Britain with water supplies bearing fluorine in concentrations from 1.8 to 4.0 ppm can be added to the record. In concentrations up to 2.5 ppm the water reduces caries substantially and causes no mottling.

CLARKE, J. H. C. The Value of Fluoridation of Domestic Water Supplies in Prevention of Dental Caries and Dental Sepsis. M. Officer 92, 4:39 (July 23), 1954.

Poor Farm's Successor—Many of the public health nursing jobs involved in placing elderly people in foster homes are profitably discussed here—guiding foster "mothers," getting old people successfully placed and settled, and lining up prospective "homes."

CRYAN, E. Foster Home Care for Elderly People. Am. J. Nursing 54, 8:954 (Aug.), 1954.

As Others See Us—A visitor from abroad looks at our Board of Preventive Medicine and Public Health and terms it "an interesting development." As an incidental comment he adds, "the disparity in America between earnings of successful clinicians and public health officers is greater even than here." He seems to think something could be done about this disparity.

DALEY, A. The American Specialist Health Officer. M. Officer 92, 2:17 (July), 1954.

Still Going Strong—Its director tells the British health people about the Cleveland Museum's program of activities in several health educational areas including television.

GEBHARD, B. The Cleveland Health Museum. Health Ed. J. 12, 3:148 (July), 1954.

Researcher Clarifies Point—There are three kinds of lung cancer: the epidermoid (constituting more than nine-tenths of all), adenocarcinomas, and the alveolar cell type. The first is the variety apparently associated with excessive cigarette smoking. The other kinds do most to produce the nonsmoker cancer minorities to be found in the undifferentiated total of lung cancer patients.

GRAHAM, E. A. Remarks on the Etiology of Bronchogenic Carcinoma. Lancet 266, 6826: 1305 (June 26), 1954.

Cancer, Coronary, and Cigarettes —The much publicized and hotly argued preliminary findings of the American Cancer Society's "prospective" attack on the assumed relationship of cigarette smoking and lung cancer are here repeated in revealing detail. Among the 200,000 men, whose smoking habits are now embalmed on tabulating cards, a sufficient number have already died to give statistical validity to the findings about which you have heard so much.

HAMMOND, E. C. The Smoking Question and Some of the Answers. Cancer News 8, 3:2 (July), 1954.

Second Trichinosis Conference—Forty-one states now require cooking of garbage fed to pigs. There are more than 12,000 hog feeders, half of whom cook their garbage—how well, no one knows. Thanks to vesicular exanthema, some garbage is now being disposed of by land fill. Five ways trichinosis might be controlled are discussed—among them, quick freezing.

HELVIC, R. J., and WEAVER, L. Control of Trichinosis by Sanitary Garbage Disposal (and three related papers). J.A.M.A. 155, 16:1388 (Aug. 14), 1954.

"If at First . . ."—Discouraging news for parents of those large families

of daughters who keep hoping for a boy. Among first-borns, 1,067 boy babies put in an appearance to each 1,000 girls. The sex ratio goes down with each succeeding addition to the brood, until among sixth children the boy ratio is only 1,040:1,000.

MYERS, R. J. The Effect of Age of Mother and Birth Order on Sex Ratio at Birth. Milbank Mem. Fund Quart. 32, 3:275 (July), 1954.

When School Children Eat—Some of the deficiencies and defects of surveyed school lunch services—and ways they might be corrected—are examined briefly. The improvement job is primarily educational. The difficulties are confused responsibility and divided authority, the remedies are practical and possible.

MYTINGER, R. E. Public Health and the School Lunch. Modern San. 6, 8:24 (Aug.), 1954.

Board Members Need Educating—A slowly evolved but, in the end, thoroughly organized "case method" was found productive in orienting lay members of a directing and supporting board. Preparations for meetings were time-consuming but long-term results prove them worth the effort.

OPPENHEIMER, J. R. Staff Participation in Interpretation to a Lay Committee. Med. Social Work 3, 3:89 (July), 1954.

They All Pitched In—Events leading up to building a community-wide pilot plan for employing a rehabilitation coordinator to look after the needs of the physically and mentally handicapped are recounted. If, and when, the demonstration is successfully completed, it is assumed the health department will take over.

RUDD, J. L. A City-Wide Rehabilitation Program. Am. Pract. 5, 8:600 (Aug.), 1954.

Syphilis Still Shortens Life—Though this will come as no surprise, you will be glad that someone made the long, slow, painstaking study which reveals that (among Negro men 25–50 years old) untreated syphilis results in a 17 per cent reduction in life expectancy.

SHAFER, J. K., et al. Untreated Syphilis in the Male Negro. Milbank Mem. Fund. Quart. 32, 3:362 (July), 1954.

More Rehab—Connecticut is exploring the possibilities in the rehabilitation of unadjusted elderly people (who now overcrowd mental hospitals) and the chronically sick. A remodeled hospital will start the rehabilitative process but community services will be organized to follow through and return the rehabilitated to their proper places in the community.

SHINDELL, S. An Approach to the "Unadjusted Elderly." Pub. Health Rep. 69, 8:734 (Aug.), 1954.

International Trade—Two of our eagerly followed explorers in the field of public health administration export some of their ideas to Great Britain. One emphasizes, among other points, the values inherent in our burgeoning teamwork concept, while the other takes modern epidemiology out of its communicable disease strait-jacket and compares its diagnosis in clinical medicine. These are papers you will be glad you read.

VAUGHAN, H. F. Education for Public Health, and GORDON, J. E. Epidemiology: the Diagnostic Discipline of Public Health. J. Roy. San. Inst. 74, 7:427 (July), 1954.

Flu and Fomites—Air disinfection procedures having failed to control the spread of respiratory diseases, surface disinfection appears to present a logical step toward that much-to-be-deserved end. There are practical, effective, and safe disinfectants.

KLARMANN, E. G. Surface Disinfection and Respiratory Ills. Modern San. 6, 6:17 (June), 1954.

If additional information is desired regarding the articles listed in this Bibliography, please communicate directly with the publications in which they appeared; the addresses are furnished for your convenience.

Am. J. Nursing (American Journal of Nursing), 2 Park Ave., New York 16, N. Y.
Am. Pract. American Practitioner. 227–231 S. Sixth St., Philadelphia 5, Pa.
Cancer News (American Cancer Society) 47 Beaver Street, New York 4, N. Y.
Health Ed. J. (Health Education Journal), Tavistock House, Tavistock Sq., London, W.C. 1, England.
J.A.M.A. (Journal of the American Medical Association), 535 N. Dearborn St., Chicago 10, Ill.
J. Immunol. (Journal of Immunology, Virus Research and Experimental Chemotherapy) Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore 2, Md.
Lancet—7 Adam St., Adelphi, London, W.C. 2, England.
M. Officer (The Medical Officer), Chronicle House, 72/78 Fleet St., London E.C. 4, England.
Med. Social Work (American Association of Medical Social Workers), 1834 K. St., N.W., Washington 6, D. C.
Milbank Mem. Fund Quart. (The Milbank Memorial Fund Quarterly), 40 Wall St., New York 5, N. Y.
Modern San. (Modern Sanitation), 855 Avenue of the Americas, New York 1, N. Y.
Nursing Outlook (American Journal of Nursing Company), 2 Park Ave., New York 16, N. Y.
Pub. Health Rep. (Public Health Reports), Superintendent of Documents, Gov. Ptg. Office, Washington, D. C.
J. Roy. San. Inst. (Journal of the Royal Sanitary Institute), 90 Buckingham Palace Road, London, S.W. 1, England.
Statist. Bull. Metrop. Life Insur. Co. (Statistical Bulletin Metropolitan Life Insurance Company), One Madison Avenue, New York 10, N. Y.

A New State Public Health Association

The Virginia Public Health Association was organized at a meeting in Richmond on September 9, to "assist in protecting and promoting public health in Virginia." It is planned that it shall become eligible for affiliation with the American Public Health Association.

Officers elected at the recent meeting are:

President—S. D. Sturkie, M.D., director, Charlottesville-Albemarle County Health Department
Vice-President—Emily G. F. Gardiner, health educator, Falls Church, Fairfax County Health Department
Secretary-Treasurer—Nancy Lutze, director of health education, Virginia Tuberculosis Association

Association News

Fourth Conference on Field Training

A Conference on Field Training of Public Health Dentists was held in New York, June 28–29, under the joint auspices of the Subcommittee on Field Training of Public Health Dentists, Dental Health Section, and the Committee on Professional Education. The conference represented the interest of the Committee on Professional Education in field training of the various public health disciplines. It was recommended in the first annual report of the Dental Health Section's Subcommittee on Field Training of Public Health Dentists, whose chairman is Philip E. Blackerby, Jr., D.D.S. Dr. Blackerby also served as chairman of the conference which was attended by 17 persons representing schools of public health, the U. S. Public Health Service, state health departments, local field training areas, the American Public Health Association, the American Dental Association, the American Association of Public Health Dentists, and the American Board of Dental Public Health.

Among the subjects discussed were the objectives and methods for providing the two types of field training, residency training and clinical education, or field experience; the skills and abilities needed by public health trainees that can be developed through residency training; and the methods for development of field training centers for public health dentists.

Conference summarizer was Shailer Peterson, Ph.D., secretary of the Council on Dental Education of the American Dental Association. The conference was made possible through a grant from W. K. Kellogg Foundation.

Specific recommendations which grew out of the conference were:

a. In order to implement programs of field training for public health personnel, adequate financing should be provided. It is therefore recommended that the American Public Health Association explore possibilities for financing through federal or state sources such public health training, including field training programs.

b. The possibility should be explored with the schools of public health of providing more clinical experience in public health practice for the dentist during the academic graduate program.

Proceedings of the conference, including in full the papers of the discussion leaders, are now in preparation and will be available at a later date. Previous conferences under APHA auspices have been held on field training of public health physicians, on public health educators, and on public health statisticians.

83rd Annual Meeting in Kansas City, 1955

The Governing Council has voted to hold the 83rd Annual Meeting of the APHA in Kansas City, Mo., on November 14–18, 1955, on the invitation of Hugh L. Dwyer, M.D., health commissioner. This will be the third meeting in Kansas City in the Association's history. The first was held in 1891, the second in 1938, nearly 50 years later.

At the time of the 1891 meeting, the membership of the Association was about 550, annual receipts and expenditures were each less than $2,000; 118

new members had been elected during the year; none of the present sections nor the Fellowship had been organized; there were 26 annual meeting papers and two committee reports—one on car sanitation, a second on the disposal of waste and garbage.

When the Association last met in Kansas City 17 years ago in 1938, Association membership was more than 6,000, of whom about one-sixth were Fellows; all but three of the 13 present sections—Dental Health, Medical Care, and School Health—were organized; nearly 600 persons had been added to the membership during the year as compared with more than 900 in 1954; annual meeting speakers numbered about 350, as compared to nearly 600 in 1954 and that number or more expected in 1955; income and expense in 1938 were each nearly $180,000, which by 1954 had risen to more than half a million dollars; about 2,300 persons registered for the 1938 meeting, whereas perhaps 5,000 may be expected in 1955. In 1938, the related organizations meeting with the APHA numbered nine; in 1954 and presumably 1955 the number will be quadrupled. Between 1938 and 1954 the number of technical exhibitors more than doubled—from 41 to 100; scientific exhibitors increased from 39 to 56.

In 1938 the Kansas City population was less than 400,000, by the present time it is more than half a million. It is a safe guess that very few delegates flew to Kansas City in 1938; by 1955 it will be the preferred form of transportation for those who do not drive their own cars. In 1938 the highest room rate quoted was $10 for a double room, the lowest $1.50 for a single room; in 1954 the respective figures are $18 and $2.50.

APHA membership application blank on page XXIII

EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

POSITIONS AVAILABLE

Physician Administrators—National public health organization seeks two physicians with experience or formal training in hospital or business administration. (1) Position as regional medical administrative consultant, considerable travel in seven northern midwestern states; (2) position as assistant director medical services, New York City office. $9,500–$12,000 depending upon qualifications. **Box PH-49,** Employment Service, APHA.

Medical Health Officer—for Shelby-Effingham County Health Department. $6,900–$9,000; may start above minimum. Must have capacity for good public relations. J. H. Griffin, Teutopolis, Ill., or Dr. O. G. Kauder, Findlay, Ill.

Medical Social Work Adviser—$3,692–$4,316. Female.

Medical Technologist I—$3,120–$3,588.

Public Health Nurse — $3,432–$3,848. Female.

Sanitarian—$4,056–$4,680. Male.

U. S. Citizenship and specified qualifications required in each case. Personnel Director, Municipal Bldg., Hartford, Conn.

Health Educator—for expanding program in local public health agency in St. Louis metropolitan area. $433–$527. Training and experience equivalent to completion of graduate course in public health, plus three years' experience in public health educational work. St. Louis County Civil Service Commission, 115 N. Meramec, Clayton, Mo.

Director of Public Health Nursing Service—New county health department in rural area of 35,000 population. Four staff nurses. Opportunity to share in establishing a unique experiment being shared with neighboring county. Offices in new Community Hospital. Close to large university centers. $5,500 with new car provided. Roger G. Knipe, M.D., Health Commissioner, Wyoming County Health Dept., Warsaw, N. Y.

Medical Health Officers—Several for local departments. M.P.H. degree or Board Certification required. Salary range $8,400–$8,700, plus travel allowance. Henry A. Holle, M.D., State Health Officer, Austin, Tex.

Director—for division of local health services. Important and challenging position. $11,250. Bruce Underwood, M.D., Commissioner, Kentucky State Dept. of Health, 620 South Third St., Louisville 2, Ky.

Health Officer—Butte County. $10,000. Requires license to practice in California. Board of Supervisors, Oroville, Calif.

Health Officer—Tulare County, $8,700–$10,956; beginning step to be determined by desired qualifications and experience. Requires license to practice in California. Tulare County Personnel Officer, Visalia, Calif.

Health Officer, M.D.—for Knox County, Tenn. Must secure Tennessee license. Population 100,000. Generalized program. In heart of TVA Lakes, the Great Smokies, and University of Tennessee. Merit system, salary $15,000, plus $600 flat for travel. Prefer physician with public health training. Alex B. Shipley, M.D., Regional Director, 201 State Office Bldg., Knoxville, Tenn.

Public Health Physician—as health officer for an established county health department of 37,000 in northwestern Illinois. $7,200–$9,000, plus travel allowance. Qualified physician may start above minimum. President, Lee County Board of Health, 123 East First St., Dixon, Ill.

Medical Officer—$649–$811; generalized public health program in San Mateo County Department of Public Health and Welfare. Administration of communicable disease control, tuberculosis, venereal diseases, and child health. Must be eligible for medical license in California. Special training or experience in public health desirable, but adequate training in allied fields might be considered. County merit system and retirement program. Civil Service Commission, Court House, Redwood City, Calif.

Public Health Physicians—Health officers of one urban, one county, and three multiple county health departments in Illinois; retirement plan or Social Security; salaries according to training, experience, and performance record.

State Position as Assistant Chief—Division of Local Health Services; salary range up to $860 per month; successful local experience and Board certification, or eligibility therefore, desired; civil service, retirement.

Roland R. Cross, M.D., Director, Illinois Dept. of Public Health, Capitol Bldg., Springfield, Ill.

Public Health Physician—Assistant chief, Division of Tuberculosis. Involves administrative and consultative duties relative to tuberculosis control program. Considerable experience in the field of tuberculosis and public health required. Eligible for Ohio license. Director, Ohio Dept. of Health, Columbus 15, Ohio.

Administrative Positions—in tuberculosis control and in communicable disease control and epidemiology. Clinical experience desirable along with training in public health and aptitude and experience in administration. $8,124–$10,104. George M. Uhl, M.D., 116 Temple St., Los Angeles 12, Calif.

Registered Sanitarian—Barstow, Calif. $360–$397. County Civil Service Office, 236 Third St., San Bernardino, Calif.

Sanitarian—$361–$439. Two years of college in sanitation and California registration required.

Public Health Nurse—$343–$417. R.N. and public health nursing certificate from California required.

Junior Public Health Nurse—$284–$343. R.N. and two years' public health nursing experience or six units of study in public health nursing required. I. D. Litwack, M.D., Dept. of Public Health, Long Beach, Calif.

Medical Social Worker—for expanding program in local public health agency in St. Louis metropolitan area. $292–$355. Completion of two years' graduate training, preferably medical social work, in an approved school of social work required. Experience desirable. St. Louis County Civil Service Commission, 115 North Meramec, Clayton 5, Mo.

Public Health Dental Hygienist—for dental health education, assistance to community dental programs, and related dental public health work with official health agency. Must be graduate of approved dental hygiene curriculum and have a bachelor's degree in dental hygiene, arts, science, or a related field. Experience in dental hygiene and public health desirable. $5,000–$5,800. **Box D-12**, Employment Service, APHA.

Director of Public Health Education—Qualified, experienced health educator. District of Columbia Division, American Cancer Society, 1415 Eye St., N.W., Washington, D. C.

Public Health Statistician—to develop expanded disease and program statistical service. Various combinations of education and experience acceptable. $440–$550.

Speech Correctionist—Two positions at Cerebral Palsy Center, Billings, Mont. Bachelor's degree with clinical membership, or eligibility for membership, in American Speech and Hearing Association, plus one year of internship or employment experience. $310–$385. Appointment may be made above the minimum.

Medical Social Consultant—Opportunity to develop program of medical social service in crippled children and cerebral palsy programs. Graduate training in medical social or social casework, plus four years' experience. $355–$440. Appointment may be made above the minimum salary step. G. D. Carlyle Thompson, M.D., Executive Officer, State Board of Health, Helena, Mont.

Public Health Nurse—for generalized program in four-county health unit. Merit system supervision. $280–$350. Eligibility for North Dakota registration and a car required, seven and one-half cents per mile for travel.

Sanitarian—for general sanitation program in four-county health unit. Salary depending on qualifications and experience. Merit system supervision. Car required, seven and one-half cents per mile for travel. Upper Missouri District Health Unit, Williston, N. D.

Public Health Staff Nurses—For generalized program in County Health Department, north San Joaquin Valley, Calif. $318–$385 at fifth year. Hospital insurance in effect. Certificate in public health nursing and California driver's license required. George F. O'Brien, M.D., County Health Officer, P. O. Box 1607, Modesto, Calif.

Public Health Nurses—R.N. supplemented by four months' training in public health nursing and eligibility for state registration required. $55–69 per week. Maine Dept. of Personnel, Chapel St., Augusta, Me.

Public Health Nurse—San Bernardino area; $327–397. **Supervising Public Health Nurse**—$360–438. Eligible for public health nursing certificate in California. Must have a car. County Civil Service Office, 236 Third St., San Bernardino, Calif.

Public Health Nurses—$4,205–$4,955 and **Junior Public Health Nurses**—$3,795–$4,545. Federal government retirement plan. Forty-hour, 5-day week. Opportunities for study and cultural development in the nation's Capital. Mrs. J. P. Prescott, Chief, Bureau of Public Health Nursing, Dept. of Public Health, 300 Indiana Ave., N.W., Washington 1, D.C.

Nurse Supervisor—B.S. degree in public health nursing; VNA experience; salary open, Mrs. Catherine Beermann, Executive Director, Visiting Nurse Association, 3798 Grand Ave., Oakland 10, Calif.

Public Health Nurses—with public health nursing training. Generalized program, including school nursing at university field training center. $338–$412. County car or mileage. Nursing Director, Kern County Health Dept., P.O. Box 997, Bakersfield, Calif.

Public Health Nurses—$275–$415. Three weeks' annual vacation, may be accummulated to a maximum of 30 working days. Sick leave may be accummulated to a maximum of 50 days. Personal car required; mileage furnished. Portia Irick, Director of Public Health Nursing, Box 711, Santa Fe, N. M.

Public Health Nurses—for generalized VNA program. $240–$350. Salary determined by education and experience.

Supervisors and Assistant Supervisors $300–$425 depending upon education and experience. Social Security and retirement plan, four weeks' annual vacation, Blue Cross Plan and $60 monthly car allowance. Visiting Nurse Service, 432 S. Gayoso St., New Orleans, La.

Certified Public Health Nurse—for generalized program in county of 37,000; 100 miles west of Chicago. Car essential. $235–$300 per month with travel allowance of $65 per month, two weeks' sick leave, three weeks' vacation, and a good retirement system. President, Lee County Board of Health, 123 East First St., Dixon, Ill.

Public Health Nurse—for generalized public health nursing program under good supervision in a beautiful rural county within good commuting distance of New York City. Five-day week; three weeks' annual vacation. $3,400–$3,800; county cars provided. Supervising Nurse, County Office Bldg., 22 Market St., Room 21, Poughkeepsie, N. Y.

International Health Vacancies

Public Health Physician—FOA Mission, Paramaribo, Surinam. M.D. and M.P.H. degree, plus experience in responsible local or state public health administration. Duties: to advise the Director of Health for Surinam on improved public health administration; to plan and organize public health activities, particularly with respect to rural health services; and to conduct training.

Public Health Physician (Regional)—FOA Mission, Iran. M.D. degree, plus minimum of three years' experience in public health work; M.P.H. degree desirable. Duties: to develop jointly with Iranian health authorities a public health program for the Regional Health Department.

Sanitary Engineer—FOA Mission, Paramaribo, Surinam. B.S. in civil or sanitary engineering, plus experience in rural field sanitation. Duties: to advise the Director of Health for Surinam on general sanitary engineering and rural and small community environmental sanitation problems; to assist in the development of sanitation projects; and to train sanitary engineering counterparts.

Public Health Educator—FOA Mission, Karachi, Pakistan. Minimum M.P.H. degree plus at least five years' experience with local, state or federal public health agencies in community health education. Duties: to advise the Ministry of Health on health education, including development of a visual aid program; to stimulate village interest in specific local health matters; and to train health educator counterparts in national, provincial, and local areas.

Public Health Nurse (Regional)—FOA Mission, Iran. B.S. degree and at least one-year postgraduate study in public health nursing. Minimum of four years' experience in public health nursing. Duties: responsible for the planning and administration of a regional public health nursing program, including training Iranian nurses, midwives, and health aides and giving demonstrations to local groups.

Salaries augmented with cost-of-living allowance. Two-year tour of duty minimum. U. S. Public Health Service, Division of International Health, Washington 25, D. C.

POSITIONS WANTED

Veterinarian—with degrees in social science and biological science desires position in veterinary public health. Rather extensive experience in administration and supervision. Oliver Kaiser, D.V.M., Phillips Hall, Michigan State College, East Lansing, Mich.

Social Work Administrator—Male, age 38. M.A. social work; Ph.D. social work; minor in public health by January, 1955. Twelve years' experience includes casework, administration, community organization, teaching at medical school and school of social work, and research. Desires administrative position in official or voluntary health agency. **Box M-14,** Employment Service, APHA.

Nutritionist—M.S. degree in nutrition and hospital experience wishes position in community education or research. No geographical limitations. **Box N-7,** Employment Service, APHA.

Physician, M.P.H., age 39—Desires position as assistant director in a chronic disease program. Interested in coordinating medical

care services. Training and experience in internal medicine, pediatrics, epidemiology and communicable diseases, and chronic diseases and rehabilitation in teaching institutions and state-wide programs. Diplomate of the National Boards of Medical Examiners. Locate anywhere. **Box PH-48,** Employment Service, APHA.

Experienced **Librarian** wishes position in library of health education agency or public health department. Background includes administrative work in professional school library, cataloguing in college library, and familiarity with public health publications. **Box Li-2,** Employment Service, APHA.

Commercial Advertisements

All communications on the following commercial advertisements should be sent to Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

(a) Health commissioner; suburb, large city, medical center, Midwest. (b) Public health physician, Diplomate or eligible, to serve as assistant director, important health organization; around $12,000; East. (c) Director, district health department; outside the United States. (d) Director, school health; city-county health department; $12,000; North. (e) Public health physicians, nurses, health educators, sanitarians; foreign assignments. (f) Public health nursing supervisor in charge of nursing education; generalized public health nursing program; university city; Southwest, $4,500–$6,000. (g) Public health nurse qualified supervise staff of 18; county health department, East. (h) Two staff nurses; college town, Northern California. (i) School nurse; Chicago area; faculty salary. (j) Pediatrician or obstetrician with maternal and child health experience; public health engineer and public health or medical statistician; school of public health being established by large university; foreign. (k) Health educator; university town, South. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

OPPORTUNITIES WANTED

(a) Public health physician; M.P.H., Harvard; Diplomate; seven years, director, important health organization. (b) Public health nursing administrator; M.P.H., Yale; seven years' supervisory experience. (c) Health educator; M.P.H.; nine years, director, health education, metropolitan health department. (d) Public health engineer; M.S. (civil engineering); 11 years, health supervisor, metropolitan health department. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

News from the Field

WHO—or Related News

Healthy Living Precedes Education

What has been described as "an outstanding example of the Middle East's battle against its age-old enemies, ignorance, malnutrition, and disease" was begun in late 1953 in a remote Egyptian village, Sirs-el-Layyan. Here is one of the regional "fundamental education centres" conceived by UNESCO for guidance in attaining elementary living standards which UNESCO believes are "essential prerequisites to the more generally accepted aspects of education."

The new center or settlement is named the UNESCO Fundamental Education Centre for the Arab States. An international staff of teachers is showing students from eight Arabian countries—Egypt, Syria, Lebanon, Jordan, Iraq, Saudi Arabia, Yemen, and Libya—how to purify the water supply and thus avoid typhoid and other water-borne diseases, how to provide proper sanitation, how to get the best agricultural—and nutritional—use from the soil, and how many elementary health problems may be met. The center includes an experimental farm and adjoins a hospital, each of which serves as a training laboratory. However, much of the training takes place in neighboring selected villages where the students live and study problems on the spot. At the end of the 19-month course the students will go back to their own countries as teachers in establishing better living standards.

The Egyptian government provides the building and other facilities and pays domestic staff, while UNESCO provides for the international staff and the maintenance of students at the center. The first of such regional centers, opened in Patzcuaro, Mexico, in 1951, serves students from 16 Latin American countries.

Soybean Milk Plant in Indonesia

In order to provide a better protein diet for the children of Indonesia, a factory for the production of powdered soybean milk is being set up in Jogjakarta in mid-Java. The plant is expected to open early in 1955 and to yield up to 600 tons of powdered milk annually when it reaches capacity. The Indonesian government plans to buy 300 tons annually for its free child-feeding program under which some 23,000 needy children each receive 40 gm. of milk daily. The powdered soybean milk can be made available for about half the cost of imported whole milk powder.

UNICEF has allocated $190,000 and the Indonesian government at least double that amount for the Jogjakarta plant. The formula to be used is the one developed by a nutrition specialist of UN's Food and Agricultural Organization, Dr. D. S. De of India who has already set up in Jakarta (Indonesia) a plant that produces 50 to 100 liters of milk a day for use in the children's clinic. Many of the technics are those used in a factory in Mount Vernon, Ohio, where about a ton of soybean milk powder is produced daily. This factory is headed by Harry W. Miller, M.D., former medical missionary in China, whose experience there led him to a process of soybean-feeding and the establishment of his plant in 1945.

In the development of plans for the Indonesian factory Donald Sabin, chief of UNICEF's Milk Conservation Unit, served as a consultant. Among others who are helping to get it started is Dr. Miller's son, who is in Indonesia on a year's FAO fellowship.

Milk Drying Plant in Nicaragua

On July 11, Nicaragua's and Latin America's first milk drying plant was formally opened in Managua. In addition to a capacity for drying more than 2,000 liters of milk an hour, the plant will also serve as a training center for technicians from El Salvador and Honduras. UNICEF has contributed imported machinery worth $115,000 for the plant, which is being built cooperatively by the Nicaraguan government and the National Milk Producers Company. They have agreed to supply free milk from the plant to 40,000 school children in rural areas for at least five years. Since 1950 these children have been receiving daily milk rations directly from UNICEF.

The new plant is managed by Reinaldo Lacayo, a Nicaraguan graduate of the University of California who has studied milk conservation in the United States under a UNICEF grant and who has had several years' experience in United States dairies. UNICEF has also provided fellowships to two plant engineers for study in the United States. One of them, Oscar Moreira, assistant technical manager, will study at Cornell University. Upon his arrival in the United States, he reported that since UNICEF assistance, milk production in his country had increased 20 per cent in quantity and 50 per cent in quality. A principal impetus to this improvement was the prospect of the milk drying plant. This is providing a market for rainy season milk surpluses which formerly went to waste. But milk producers are learning that to be successfully dried milk must be clean and wholesome.

As a result of the UNICEF milk distribution program, the Nicaraguan government has greatly increased its expenditures for nutrition, health, and educational programs. In 1953 expenditures for milk alone were nearly as great as the entire public health budget of 1950, when UNICEF first began milk distribution in the country.

UNICEF is also helping to establish milk drying plants in Brazil, Bolivia, Chile, Costa Rica, El Salvador, Honduras, and Mexico.

Malaria Eradication in Jordan

The Government of Jordan and the United Nations Relief and Works Agency for Palestine Refugees have made a five-year agreement for a program to eradicate malaria from the Jordan and Yarmuk valleys. The program is under the direction of Dr. Mohieddine Farid, an Egyptian epidemiologist loaned by WHO. He is being assisted by an entomologist and teams of Palestine refugee malaria technicians.

Equipment for this mass campaign of larviciding mosquito-breeding water surfaces, cleaning all potential breeding places for mosquitoes, stocking pools and springs with larvae-eating Gambusia fish, and DDT spraying of frontier villages, has been shipped to Jordan. Included are a large modern laboratory for tests, two motor boats for patrolling pools and dams, jeeps, insecticides, and spraying equipment.

Electron Accelerator for USPHS

The National Institutes of Health, the research arm of the Public Health Service, has received a gift of what is reported to be the most powerful electron accelerator of its kind. It is said to produce high-voltage electron energy 25 times more powerful than that from any other commercially available generator.

Donated by the Liggett and Myers Tobacco Co., the machine is a 3,000,000 volt Van de Graaff generator constructed in 1950 by the High Voltage Engineering Corporation of Cambridge, Mass., for an experimental program of the

tobacco company. The 30-ton apparatus has been installed in the radiation wing of the new 500-bed Clinical Center at the National Institutes of Health. It will be used in research on the biological effects of high-energy radiation and will also be made available for use by other federal agencies.

A New Radiation Research Magazine

Radiation Research, the official organ of the Radiation Research Society, began publication as a bi-monthly in February, 1954, to "promote the integration of physics, chemistry, biology, and medical research as they are concerned with the effects of radiation on matter." Its editor is Titus C. Evans, College of Medicine, State University of Iowa, Iowa City; its publisher, the Academic Press, 125 E. 23rd St., New York 10, N. Y. Annual subscription $9.

The 1,000th Community to Fluoridate

A special ceremony on August 12 inaugurated the fluoridation program of Osawatomie, Kans., the 1,000th community in the United States to initiate such a program. Among the speakers were Leslie M. Fitzgerald, D.D.S., president of the American Dental Association, and John Knutson, D.D.S., chief dental officer of the Public Health Service.

Dr. Fitzgerald reported on the results of certain studies relating to fluoridation. In a 10-year study at Bartlett, Tex., where the water supply naturally contains eight times as much fluorides as is recommended for fluoridation, "no adverse effects of any kind were found upon the internal organs or bone structure of the 237 persons of all ages included in the study." In another study of more than 2,000 children in high fluoride areas of Amarillo and Lubbock, Tex., and the fluoride-deficient area of Cumberland, Md., no differences were found in the bone structure of the children of the three towns.

Osawatomie is a farming community of about 4,500 persons and brings to about 18,000,000 the number of persons now protected by fluoridation programs. In addition, about 3,500,000 persons live in areas served by water supplies containing fluorides naturally in as high or higher amounts than recommended.

1956 Statistics Conference

The executive committee of the Public Health Conference on Records and Statistics has selected March 12–16, 1956, for the Sixth National Meeting of the conference. It has made early announcement of the date in the hope that conflicts with meetings of similar or related groups might be avoided.

PERSONALS

The following Public Health Service officers have been assigned to U. S. Operations Missions in various parts of the world: JAMES A. CLARK, JR., sanitarian, Iraq; ALBERT L. PLATZ, sanitary engineer, Thailand; SANFORD E. SHIELD, entomologist, Thailand; TRAVIS E. MCNEEL, malariologist, the Philippines; and ARTHUR DOPMEYER, sanitary engineer, Jordan.

MILDRED B. BARRY,* former consultant nutritionist, Division of Maternal and Child Health, Rhode Island Department of Health, is now consultant nutritionist, Western District Branch, North Carolina State Board of Health, Asheville.

DAVID E. BIGWOOD, JR., M.D.,* Utica (N.Y.) health officer, has been appointed health commissioner of Syracuse to succeed CLEALAND A. SARGENT, M.D.,* now Binghamton health officer.

GEORGE M. BROTHER, M.D.,† for the past two years assistant area medical administrator, has succeeded the late CECIL A. Z. SHARP, M.D.,* as area medical administrator of the St. Louis (Mo.) Office, United Mine Workers of America Welfare and Retirement Fund.

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* Fellow.
† Member.

L. E. BURNEY, M.D.,* Indiana state health commissioner, has been recalled to active duty with the Public Health Service and is deputy chief, Bureau of State Services, Washington, D. C. Dr. Burney is chairman, Committee on Professional Education, APHA.

LAWRENCE A. CAPPIELLO, M.D.,† former educational consultant, the Western New York Committee for Education on Alcoholism, Inc., has received a teaching assistantship in the Department of Health and Safety at Indiana University, Bloomington, to continue studies for a graduate degree.

HENRY L. CRANSHAW, former director, Division of Accounts and Audit, is now director of the Bureau of Administration, Maine Department of Health and Welfare.

JEAN A. CURRAN, M.D., dean of the State University of New York College of Medicine, Brooklyn, has been appointed associate executive dean for medical education, State University of New York, to assist in program planning for the health professions. Dr. Curran will also continue as professor of the history of medicine in Brooklyn.

MARY V. DEMPSEY,* statistician for the National Tuberculosis Association since 1941, retired in May, 1954. She continues to live in New York City.

PAUL M. DENSEN, D.Sc.,* former associate professor of biostatistics, Pittsburgh School of Public Health, is now director of research and statistics, Health Insurance Plan of Greater New York, succeeding NEVA R. DEARDORFF, Ph.D.,† who becomes consultant to HIP and serves on its board.

BENJAMIN G. DININ, M.D.,† medical superintendent of Cumberland Hospital, New York City Department of Hospitals, has been appointed medical superintendent of the department's Metropolitan Hospital.

VIVIAN V. DRENCKHAHN,* for the past two years regional officer, Health Education of the Public, WHO Regional Office for Europe, after a period on home leave, is in Calcutta, India, teaching health education at the All India Institute for Hygiene and Public Health.

JACK EVANS, executive secretary, Kansas Mental Health Association, has resigned to return to his former position as clinical psychologist, Mental Hygiene Division, Kansas State Board of Health, Topeka.

RUTH J. FRANTZ, R.N., M.P.H.,* associate in school nursing, New York State Education Department, resigned on September 1, 1954.

DONALD K. FREEDMAN, M.D.,* staff member of the Bureau of Chronic Diseases, California State Department of Public Health, has been assigned as medical consultant to the California State Department of Social Welfare through a contractual agreement between the two agencies. His new offices are at the Department of Social Welfare, Sacramento.

WARFIELD GARSON, M.D.,† who recently received an M.P.H. degree from the Johns Hopkins School of Hygiene and Public Health, has been appointed chief, Venereal Disease Control Section, North Carolina State Board of Health, Raleigh, succeeding W. G. SIMPSON, M.D.,† who is now consultant in the Dallas, Tex., Regional Office, Public Health Service.

HARRY E. GORESLINE, Ph.D.,* chief, Stability Division, Quartermaster Food and Container Institute for the Armed Forces, has been promoted to the newly created post of associate director for research, Food Laboratories, Washington, D. C.

ARNOLD E. GREENBERG,† formerly with the Richmond Field Station, University of California, is now associate sanitary microbiologist, California Department of Public Health, Berkeley.

CARLETON R. HAINES, M.D., recent resident in surgery, Pondville State Cancer Hospital, Walpole, Mass., is now director, Division of Cancer Control, Vermont State Department of Health, Burlington.

HAROLD R. HARLAN, D.D.S., M.P.H.,† chief of dental health education, Newark (N.J.) Department of Health and member of the faculty, Seton Hall University School of Nursing, has been appointed also to the faculty of Columbia University, School of Dentistry.

ANNA J. KALMANOWITZ, R.N.,† former nurse consultant, Lower East Side Rheumatic Fever Project, New York City, has been appointed director of nursing, Beth Israel Hospital, Boston, Mass., succeeding MARY C. GILMORE, R.N., retired.

JAMES B. KINDLER, former medical entomologist, Beltsville Agricultural Research Center, Md., is now sanitarian, Fairbanks, Alaska.

DANIEL KLEPAK, chief of the Local Assistance Section, Office of Business Administration, New York State Health Department, is on leave of absence as a research accountant with the Commission on Fiscal Affairs of State Government.

GEORGE P. LARRICK, deputy commissioner of food and drugs since June, 1951, and a career employee of the Food and Drug Ad-

* Fellow.
† Member.

ministration since 1923, has succeeded CHARLES W. CRAWFORD, retired, as commissioner.

ALEXANDER D. LANGMUIR, M.D.,* chief epidemiologist, Communicable Disease Center, Public Health Service, heads a Foreign Operations Administration project in East Pakistan fighting outbreaks of disease resulting from floods. Members of his team include DR. WILLIAM CLARK, borrowed from the California Health Department, and Public Health Service insect control officers JAMES COFFEY and DONALD JOHNSON; KENNETH C. LAUSTER,* sanitarian; and ROBERT SHANNON, administrative officer.

NICHOLAS J. LAVNIKEVICH, M.P.H.,† former director of health education, Northern Worcester County (Mass.) Public Health Association, is now executive secretary, Northwest Chapter, Connecticut Heart Association, and part-time field representative of the state association.

RUTH M. LEVERTON,† professor of human nutrition, University of Nebraska, Lincoln, received the 1953 Borden Award of the American Home Economics Association for fundamental research in the field of human nutrition.

MAURICE E. LINDEN, M.D., former program director, Gerontologic Study Center, Norristown (Pa.) State Hospital, has been appointed director, Division of Mental Health, Philadelphia Department of Public Health.

JOHN A. LOGAN, D.Sc.,* formerly in the Division of Medicine and Public Health, the Rockefeller Foundation, stationed at the London School of Hygiene and Tropical Medicine, is now chairman, Civil Engineering Department, the Technological Institute, Northwestern University, Evanston, Ill.

HELEN LOVELL, nutritionist, Iowa State Health Department, has resigned to join her husband in Golden, Colo. She has been succeeded by JULIA E. DEARCHS, formerly with the Dairy Council in Ohio.

ROBERT M. MCAMMOND, former assistant director, the Office of Medical Defense, State Department of Health, has been appointed director of the newly created Office of Planning and Procedure, New York State Department of Mental Hygiene.

WILLIAM A. MARKEY, former administrative resident, Beth Israel Hospital, Boston, has been appointed assistant director and director of outpatient department, Montefiore Hospital, Pittsburgh, Pa.

KARL F. MEYER, D.V.M., Ph.D., L.L.D.,* director since 1921 of the Hooper Foundation, University of California Medical Center, San Francisco, retired on July 1.

F. LLOYD MUSSELLS, M.D.,† since 1953 medical director and acting executive director since February, 1954, has been named executive director, Philadelphia General Hospital, succeeding AUGUST GROESCHEL, M.D.,* resigned.

HERBERT NOTKIN, M.D.,* assistant chief, Bureau of Medical Services and Hospitals, Maryland State Department of Health, has resigned to become medical director, Onondaga County Department of Welfare and Onondaga County Hospital and associate professor of preventive medicine, New York State University College of Medicine, Syracuse, N. Y.

ABRAHAM OPPENHEIM, M.D.,* assistant visiting surgeon at Harlem and Montefiore Hospitals, has been named to the newly created post of director of cancer control, New York City Health Department.

RUTH M. OLSON, R.N.,† public health nursing consultant, Bureau of Maternal and Child Hygiene, Connecticut State Health Department, has resigned to become superintendent of the New Britain Memorial Hospital.

VINSON R. OVIATT,† former public health engineer, Barry County, is now engineer in charge of hospital sanitation, Michigan Department of Health, Lansing.

HERBERT POLLACK, M.D.,* president, American Diabetes Association, has been appointed associate professor of clinical medicine, New York University-Bellevue Medical Center's Post-Graduate Medical School, New York City.

WARREN V. POWELL, former junior bacteriologist-serologist, New Mexico State Health Department, is now sanitarian, the Greater Anchorage Health District, Alaska Territorial Health Department.

FRANK L. QUILLMAN, M.D.,† director, Champaign-Urbana Public Health District, Champaign, has resigned to become director, Montgomery County Health Department, Hillsboro, Ill.

VERONICA RICHEIMER,* former director of nurses, Muscogee County (Ga.) Health Department, has become educational director, Dade County Health Department, Miami, Fla.

LESTER J. ROSNER, former executive assistant, has been appointed to the new post of administrative assistant commissioner, New York City Health Department.

THORNDIKE SAVILLE, Dr.E.,* dean, New York

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* Fellow.
† Member.

University's College of Engineering, was in Europe recently representing the Wave Research Council of the Engineering Foundation at the Fifth International Congress on Coastal Engineering in Grenoble, France, and heading the United States and Canadian delegations to the Second International Conference on Engineering Education in Zurich, Switzerland. He also visited the Dutch Water Authority and the Royal Institute of Technology in Stockholm, Sweden.

W. L. SCHOLES, D.D.S., is the new director, Division of Dental Hygiene, Alabama State Department of Health, Montgomery.

SAMUEL C. STEIN, M.D., supervisor of chest clinics, Philadelphia Public Health Department, and assistant professor of medicine, University of Pennsylvania School of Medicine, has been appointed medical director, International Ladies' Garment Workers' Union Health Center, Philadelphia.

WILLIAM F. SWANSON, D.D.S., associate dean since 1947, has been appointed dean, University of Pittsburgh (Pa.) School of Dentistry.

GEORGE E. SYMONS, Ph.D.,* consultant and technical editor in air and water pollution, has been appointed also a research associate, Research Division, New York University's College of Engineering.

EDWARD TAYLOR, D.D.S., dental director, Texas State Department of Health, is reported on indefinite sick leave. He can be addressed in care of Travis County Tuberculosis Sanatorium, Webberville Road, Austin. GLOVER JOHNS, D.D.S., is serving as acting director of dental health.

DONALD TRAUGER, former research associate, Bureau of Social Research, Health and Welfare Federation of Alleghany County, Pa., has been named associate director, Social Research Division, National Tuberculosis Association, New York City.

VIRGINIA H. WALKER, formerly with the Tulane University Urban Life Research Institute, has been appointed assistant executive secretary and coordinator of section activities, American Nurses' Association, New York City.

HELEN M. WALLACE, M.D.,* is chairman of a new committee on epilepsy that has been formed by New York City's Interdepartmental Health Council to make a study and survey of the health needs of persons in the city with epilepsy.

EDWIN B. WILSON, Ph.D.,† professor emeritus of vital statistics, Harvard University, is a member of the Scientific Advisory Board, Tobacco Industry Research Committee.

MARY WOLKING, assistant chief, Bureau of Public Health Nursing, San Diego Department of Public Health, has retired after 30 years of service.

HAROLD B. WOOD, M.D., Dr.P.H.,* has retired from the School Division, Pennsylvania State Department of Public Health, Harrisburg, after more than 50 years in public health activities, principally in Pennsylvania. His Dr.P.H. was received from the University of Pennsylvania in 1910, one of the earliest on record. He is a Charter Fellow of the APHA.

DEATHS

H. J. GERSTENBERGER, M.D.,* professor emeritus of pediatrics, Western Reserve University, Cleveland, Ohio (Maternal and Child Health Section).

WALTER B. JOHNSON, M.D.,* deputy state and county health officer of Dorchester County, Md., on June 4 (Health Officers Section).

LESTER C. NEER, D.V.M.,† health commissioner of Middletown, Ohio, since 1947, on May 8 (Food and Nutrition Section).

MRS. THORNTON B. PENFIELD,† of Englewood, N. J., on September 7 (Unaffiliated).

LEE A. RADEMAKER, M.D.,† a surgeon in private practice and former chairman, National Advisory Committee on Local Health Units, at the age of 51 while attending a meeting of the International College of Surgeons (Health Officers Section).

CONFERENCES AND DATES

American Public Health Association. Headquarters: Memorial Auditorium, Buffalo, N. Y. October 11–15.

State and Regional Public Health Meetings:

Arkansas Public Health Association. Marion Hotel, Little Rock, Ark. October 28–29.

Florida Public Health Association. Roney Plaza Hotel, Miami Beach, Fla. October 21–23.

Oklahoma Public Health Association. A. & M. College, Stillwater, Okla. November 8–10.

Meetings of Other Organizations Coming in October, November, and December:

American Academy of Pediatrics. Chicago, Ill. October 3–7.

American Cancer Society. Hotel Roosevelt, New York, N. Y. October 17–24.

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* Fellow.
† Member.

American Congress on Obstetrics and Gynecology. Palmer House, Chicago, Ill. December 13–17.

American Council on Education. Chicago, Ill. October 14–15.

American Dental Association. Miami, Fla. November 8–11.

American Dietetic Association. Philadelphia, Pa. October 26–29.

American Medical Association. Clinical Meeting. Miami, Fla. November 30–December 3.

American Occupational Therapy Association. Shoreham Hotel, Washington, D. C. October 16–22.

Arthritis and Rheumatism Foundation. New York, N. Y. October 4.

Association of American Medical Colleges. Bedford Springs, Pa. October 25–27.

Association of Military Surgeons of the U. S. Hotel Statler, Washington, D. C. November 29–30.

Association of State and Territorial Health Officers. Washington, D. C. December 6–10.

Federation of Sewage and Industrial Wastes Associations. Netherland Plaza Hotel, Cincinnati, Ohio. October 11–14.

National Adult Education Association with the Council of National Organizations of Adult Education Association of the U. S. Morrison Hotel, Chicago, Ill. November 5–9.

National Association for Mental Health. Hotel Statler, New York, N. Y. October 23–25.

National Association of Housing Officials. Philadelphia, Pa. October 10–14.

National Rehabilitation Association. Baltimore, Md. October 24–27.

National Safety Council. Conrad Hilton Hotel, Chicago, Ill. October 18–22.

National Society for Crippled Children and Adults. Statler Hotel, Chicago, Ill. November 3–5.

National Social Welfare Assembly, Inc. Hotel Roosevelt, New York, N. Y. December 6–7.

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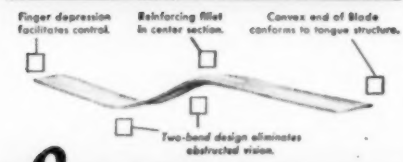
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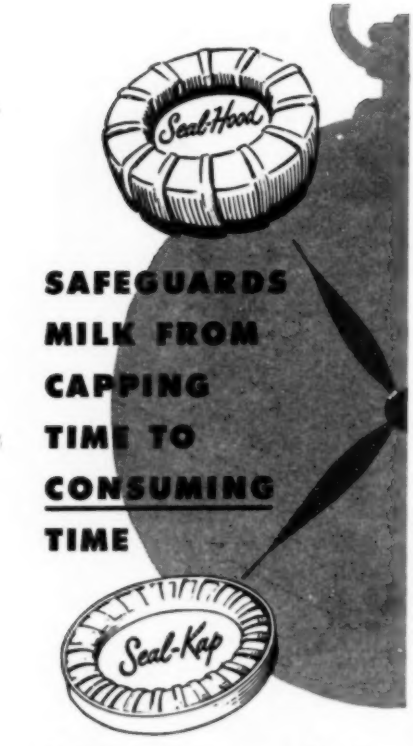

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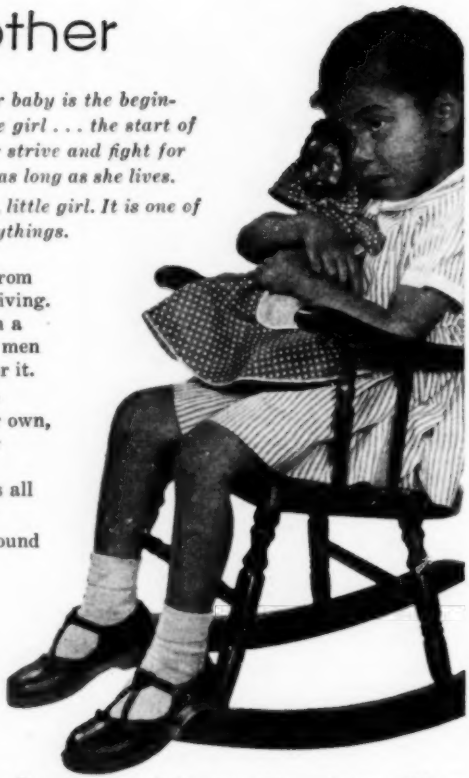

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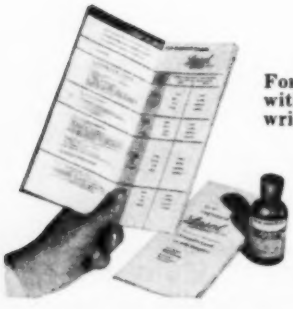

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